

Exxon Valdez Oil Spill

Federal Trial Transcript

Case Number A89-0095 civil

1994

Volume 23 - Volume 33

Vol 23 3954

- (1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 In re:) Case No. A89-0095 CIV (RRD)
 (3)) Anchorage, Alaska
 The Exxon VALDEZ) Monday June 6, 1994
 (4)) 8:00 a.m.

- TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY - 23RD DAY
 (10) BEFORE THE HONORABLE H. RUSSEL HOLLAND, JUDGE
 VOLUME 23, Pages 3954 - 4136

Realtime Transcription

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- (1) PROCEEDINGS
 (2) (Jury out at 8 05 a m)
 (3) (Call to Order of the Court)
 (4) THE COURT Good morning, ladies and gentlemen This
 is the continuation of trial in case A89-0095 civil in re the
 (5) Exxon Valdez As you know, counsel we re convened at this
 (6) time to consider any exceptions you may have to jury
 (7) instructions although in this case it's my understanding that
 (8) we have an agreement that you were going to do that in
 (9) writing
 (10) Do I have from the plaintiffs both your exceptions to the
 (11) instructions that I propose to give as well as your exceptions
 (12) to my not giving anything that you ve requested?
 (13) MR O NEILL Yes, sir, you do
 (14) THE COURT Okay Let me ask, I need - I think I
 (15) need to address this to Mr Oesting, probably, but whomever I
 (16) have a separate plaintiffs' objection to instruction 36?
 (17) MR OESTING Yes, Your Honor
 (18) THE COURT I don't remember our discussing that
 (19) MR OESTING We didn't Perfectly candid, at the
 (20) time I read it the first time I had one category of the issues
 (21) in the case When I got the full package Saturday and reviewed
 (22) them again completely, it leapt off the page at me, so I felt I
 (23) needed to make a formal objection there having previously
 (24) argued our objections to you in chambers
 (25)

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- (1) THE COURT My point is I don't remember that I heard
 (2) this particular one before This jumps out at me as something
 (3) that I m saying, Huh?
 (4) MR OESTING And I m saying you are correct in that
 (5) perception
 (6) THE COURT I am correct, okay
 (7) Well Mr Daum have you seen plaintiffs' objection to our
 (8) instruction 36?
 (9) MR DAUM Yes, I have
 (10) THE COURT Okay How do you suggest that we approach
 (11) this problem? Are you ready to deal with it right now?
 (12) MR DAUM Well, I can deal with it We certainly
 (13) don't agree with the plaintiffs, we think the instruction is
 (14) fine as it is
 (15) THE COURT You re talking at the same time Finish,
 (16) Mr Daum
 (17) MR DAUM I can handle it any way Your Honor wants
 (18) We certainly don't agree with the plaintiffs We think the
 (19) instruction is correct as given and this instruction, or a very
 (20) close variation of it has been in our package since mid
 (21) April
 (22) THE COURT Something close to what we are in fact
 (23) giving, what we have included in the package?
 (24) MR DAUM Yes
 (25) THE COURT All right Well, let me suggest this

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- (1) You're going to be talking to the jury for quite a while
 (2) That will give me a chance to look at it and think about it
 (3) some while you're talking to the jury And we'll - we'll take
 (4) another look at number 36 at some break between arguments
 or
 (5) between arguments and my reading of the jury instructions
 (6) Thank you, Mr. Oesting
 (7) Mr. Daum, do I have all of Exxon's exceptions to the
 (8) instructions that I propose to give, as well as any exceptions
 (9) to my not giving instructions that you have requested in
 (10) writing?
 (11) MR. DAUM: Yes, Your Honor. It's a pleading called
 (12) Objections. It includes both our objections to the
 (13) instructions you're giving and our refused instructions, if you
 (14) would.
 (15) THE COURT: Is there anything further that we need to
 (16) do before oral argument?
 (17) MR. O'NEILL: Yes, sir. It's a hyper-technicality,
 (18) but the rules provide that we object to the instructions after
 (19) the arguments but right - after Your Honor instructs but right
 (20) before the jury retires. I -
 (21) THE COURT: I've never done it that way.
 (22) MR. O'NEILL: I haven't either, but because of the
 (23) size and the nature and the magnitude of this case, I assume
 (24) that because we filed these written exceptions that we're
 (25) waiving the timing with regard to that technicality and we're

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- (1) standing on the instructions that we've filed
 (2) MR. DAUM: Mr. O'Neill, I think, is correct as to the
 (3) Eighth Circuit. I don't think he's correct as to the Ninth
 (4) but I would - if he's right, it's not waivable and the right
 (5) answer is we should deem that the objections in writing are
 (6) made after Your Honor's instructions, except as to changes in
 (7) the instructions as actually given. That's the solution to the
 (8) problem. I think we're safe if it's on the record.
 (9) THE COURT: With that agreement, we'll proceed
 (10) although that rule sounds absolutely silly to me.
 (11) MR. DAUM: It is silly, Your Honor.
 (12) MR. O'NEILL: I got dinged. I got hurt on appeal on it
 (13) once.
 (14) MR. DAUM: It's a rule outside the Ninth Circuit.
 (15) It's a genuine problem there.
 (16) THE COURT: Anything else we need to go through at
 (17) this stage?
 (18) MR. O'NEILL: No, sir.
 (19) THE COURT: Okay, fine.
 (20) Call the jury in, please.
 (21) MR. LYNCH: Your Honor, just for clarity, Mr. -
 (22) Captain Hazelwood had also submitted objections.
 (23) THE COURT: Oh, thank you very much.
 (24) Mr. Chalos, do I have your full set of exceptions also?
 (25) MR. CHALOS: Yes, you do, Your Honor.

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- (1) THE COURT: Thank you very much. Sorry for the
 (2) oversight.
 (3) (Jury in at 8:10 a.m.)
 (4) MR. LYNCH: Just wanted to be sure we lived up to the
 (5) Eighth Circuit rule.
 (6) THE COURT: Please be seated.
 (7) Good morning, ladies and gentlemen. As I think you realize
 (8) by now, this is the time in the case when the attorneys are
 (9) entitled to argue their respective views of the evidence to
 (10) you. I don't know whether counsel will do so or not, but you
 (11) should know that counsel already have my jury instructions that
 (12) will be read to you after their arguments. They may or may
 (13) not, as they choose, refer to some of these instructions in the
 (14) course of their arguments. It's entirely proper that they do
 (15) so, if they wish.
 (16) We have an agreement that the time for oral argument will
 (17) be two hours per side. Because the plaintiffs have the burden
 (18) of proof, they are entitled to divide their argument between an
 (19) opening and a closing argument with the defendants' arguments
 (20) in between.
 (21) We will take breaks today about the same way we have been
 (22) doing it before, although we'll do it in a fashion so as not to
 (23) break up anyone's argument.
 (24) Mr. O'Neill.
 (25) CLOSING ARGUMENT BY MR. O'NEILL.

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- (1) MR. O'NEILL: May it please the Court, counsel Ladies
 (2) and Gentlemen of the Jury. When I started this trial, I vowed
 (3) that I would try to keep whatever anger that I felt about the
 (4) wreck of the Exxon Valdez in check. When Captain Hazelwood
 and
 (5) Mr. Iarossi came in here and in a backhanded way apologized,
 (6) they both said, "I was devastated."
 (7) Those were the words that they used, but they weren't
 (8) devastated. They didn't feel devastated and, in point, people
 (9) that were devastated were over 10,000 fishermen and Natives
 (10) land owners, municipalities and Native corporations, people
 who
 (11) make their living for the most part from the sea with their
 (12) hands - purse seiners, driftnetters, setnetters, their crew,
 (13) their family, the whole fabric of Alaskan life.
 (14) And then on the last day of the trial testimony, Mr. Rouse
 (15) comes in and says Exxon Corporation's policies allow a
 relapsed
 (16) alcoholic to be the captain of a supertanker despite the known
 (17) risks to society and, in this case, the known risks to over
 (18) 10,000 fishermen and Natives who make their living with their
 (19) hands out of the sea.
 (20) What they did in the years leading to the wreck of the
 (21) Exxon Valdez wasn't right, it was wrong. And what they did
 (22) when they came into the courtroom and one after the other
 (23) changed their stories was wrong. The oath in a courtroom, the
 (24) oath in a deposition, is a serious, serious thing. When the
 (25) chairman of the board of Exxon Corporation goes before the

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- (1) Congress of our country to testify, that is a serious serious
- (2) thing
- (3) In the environment of the courtroom we try to be as polite
- (4) as we can because these are long, long days that we have to
- (5) put
- (6) in and to express outrage every time one of these guys
- (7) changed
- (8) the story would have made the environment in the courtroom
- (9) unbearable for all of us But their respect for the truth
- (10) doesn't exist Their lack of respect for the truth is
- (11) outrageous It's outrageous
- (12) Now you are going to get at the end of today what is
- (13) called a special verdict form, and this is your ballot And
- (14) it'll look just like this except it'll be eight and a half by
- (15) 11 And you're going to answer three questions Do you
- (16) unanimously find from the preponderance of the evidence that
- (17) the defendant Hazelwood was negligent as that term has been
- (18) defined in the instructions and that his negligence was a legal
- (19) cause of the grounding of the Valdez, yes or no This is a
- (20) ballot
- (21) Then the question is asked, Do you unanimously find from a
- (22) preponderance of the evidence that the defendant Hazelwood
- (23) was
- (24) reckless, and that his recklessness was a legal cause of the
- (25) grounding of the Exxon Valdez?
- (26) So for Hazelwood you get negligence and recklessness and?
- (27) then we get to the 64 dollar question Do you unanimously find
- (28) from a preponderance of the evidence that the Exxon
- (29) defendants

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- (1) were reckless and that their recklessness was a legal cause of
- (2) the grounding of the Exxon Valdez You come to a unanimous
- (3) verdict and whoever is presiding signs it
- (4) So you're going to answer three questions on this form and
- (5) then return the form
- (6) Now what I'm going to talk about is why you should answer
- (7) these questions yes, yes, and yes Makes sense
- (8) Let's take a look at some of the jury instructions if we
- (9) could
- (10) Instruction number 27 - when I got these I didn't know
- (11) what number they were going to be and so you see my good
- (12) handwriting right here
- (13) In this case - before we get to this on the negligence
- (14) instruction Exxon has conceded that they were negligent that
- (15) Captain Hazelwood's leaving the bridge was negligent and that
- (16) it was a legal cause of the grounding of the Valdez and I'll
- (17) show you the stipulation in a couple minutes Exxon's
- (18) conceded
- (19) that it was negligent You need to also address whether
- (20) Hazelwood was negligent and he'll give you a negligence
- (21) instruction
- (22) Now I want to talk about recklessness because that's why
- (23) we're here
- (24) A defendant's conduct before the grounding of the Exxon
- (25) Valdez manifested reckless callous disregard for the rights of
- (26) others and such conduct was a legal grounding of the Exxon

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- (1) Valdez
- (2) Two steps Was Exxon's conduct and Hazelwood's conduct
- (3) reckless and was it a legal cause Not the legal cause, a
- (4) legal cause
- (5) Okay Next instruction
- (6) What does it mean to be reckless - and the Court will
- (7) instruct you You're going to have the instructions back
- (8) there, you'll have a package of instructions back there You
- (9) have to be subjectively conscious of a particularly grave
- (10) danger or risk of harm Supertanker accidents, supertanker
- (11) wrecks, supertanker incident supertanker groundings - we
- (12) asked them all and they said that they knew that was a risk
- (13) The risk must have in fact eventuated a grounding The
- (14) defendant must have disregarded the risk in determining how to
- (15) act, disregarded the risk of a relaxed alcoholic in the
- (16) grounding, and, fourth, the conduct must have involved a gross
- (17) deviation from the level of care which an ordinary person would
- (18) use, and that's what I'm going to talk about
- (19) Next instruction - now a corporation is responsible for
- (20) the reckless acts of its employees who are managers and the
- (21) reckless act of a corporate officer is the reckless act of the
- (22) corporation if it's done in the course and scope of his
- (23) duties Corporations can only act through people, okay?
- (24) That's what this is in English
- (25) And what is somebody who's in a managerial capacity?

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- (1) Somebody who supervises other employees Makes sense
- (2) We know
- (3) what a manager is and the instructions and our good sense to
- (4) deal with what a manager is, and the last of the -
- (5) How many more do we have one or two more?
- (6) MS WAGNER One
- (7) MR O'NEILL One more instruction to talk about to
- (8) put this in context
- (9) The burden of proof that - we all know that in a criminal
- (10) case you have to prove your case beyond a reasonable doubt
- (11) so
- (12) that the defense in a criminal case tries to cast doubt
- (13) That's in a criminal case okay? That isn't good enough in
- (14) this case In this search for truth, you are to decide this
- (15) civil case on a preponderance of the evidence standard
- (16) Which
- (17) has more convincing force and produces in your mind a belief
- (18) that what is sought to be proved is more true than not true
- (19) 51/49
- (20) It isn't enough to say there may have been a conspiracy to
- (21) sneak into the freezer and change the blood, okay? That's an
- (22) attempt to cast some reasonable doubt That isn't enough
- (23) It's you weigh the evidence, and if the plaintiffs are 51
- (24) percent versus 49 percent for the defendants the plaintiffs
- (25) win That's the burden of proof we're dealing with It is not
- (26) beyond a reasonable doubt it is preponderance of the
- (27) evidence
- (28) okay? And you'll have this instruction back there and this
- (29) instruction is a - is in words a reduction of the truth behind

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(1) how we search for the truth Okay? Standard of proof
 (2) There are two ways in which Exxon can be liable for
 (3) recklessness The first is its own acts, the acts of all of
 (4) these people were reckless And the second is if Captain
 (5) Hazelwood is a managing agent of Exxon - and he is - and his
 (6) acts were reckless, that also gets us there
 (7) So there are two theories the acts of these people with
 (8) regard to their treatment of Hazelwood and his alcoholism over
 (9) a number of years, first theory Second theory he himself is
 (10) a managing agent and he, himself, was reckless
 (11) Now let me explain to you the problem that the plaintiffs
 (12) had in this search for the truth
 (13) Of all of the people that we've put on the stand over a
 (14) hundred, they're not our people They don't purse seine They
 (15) don't setnet they don't gill net they don't harvest from the
 (16) sea Those were Exxon Corporation people some of whom
 (17) told the truth and some of whom didn't These were the employees
 (18) of the 26th biggest corporation in America 26th biggest
 (19) institution in the world not the 26th biggest corporation in
 (20) America, the 26th biggest institution in the world And we had
 (21) to find those people at Exxon that would tell the truth before
 (22) Exxon closed ranks which they did Which they did
 (23) So the Steve Days or the Mary Williamsons or the Jim Shaws
 (24) or even the Captain Stalzers of the world we needed to get
 (25) their testimony before the party line was put into place And

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(1) you see what happens when the party line was put into place,
 (2) because we got to see the president of Exxon Corporation come
 (3) in here and tout the party line, and we compared that to what
 (4) he told the Congress of the United States
 (5) Now the wreck of the Exxon Valdez we had by what they
 (6) claim their most competent captain on the vessel and there had
 (7) been 8800 transits before the spill and the Arco Juneau and the
 (8) other vessel had gone by through the same conditions, there
 (9) had been no groundings on Bligh Reef since the wreck of the
 (10) Columbia 1941 or 1942 and then we get the biggest oil spill
 (11) in America The wreck itself is proof that there must have
 (12) been something seriously wrong and let's see how we get
 (13) there
 (14) The Gulf Coast Mr Tompkins, the fleet manager On
 (15) February 11th of 1985, he has Captain Hazelwood put on notice
 (16) that he is under investigation by Ben Graves Captain Pierce
 (17) who also worked over here gets an anonymous phone call from
 (18) a fellow officer of Hazelwood saying something's wrong there's a
 (19) problem with his job Captain Pierce comes in here and says -
 (20) in order to try to hype the self identification theme of
 (21) theirs - Well I just called him as a friend but we know
 (22) Captain Hazelwood was under investigation He was told he
 (23) was
 (24) under investigation and Captain Pierce on cross-examination
 (25) admits that job problems were discussed with both the captain
 (26) and the anonymous caller
 (27) Pierce goes to Ben Graves and reports this and what does

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(1) Graves say Is the captain's name H does it begin with H
 (2) They talk or whisper in codes I guess
 (3) And he goes to Tompkins to tell Tompkins that Hazelwood is
 (4) in treatment and Tompkins says Good Why? Graves knows
 (5) that
 (6) there's a problem Tompkins knows there's a problem, Pierce
 (7) knows there's a problem
 (8) Captain Hazelwood got caught He didn't self-identify, he
 (9) got caught What's the easiest way to prove that? Ask Captain
 (10) Hazelwood Captain Hazelwood, did you get caught, you
 (11) didn't
 (12) self identify did you? No no you got a call from Exxon
 (13) Corporation through Captain Pierce who said you have a
 (14) problem
 (15) I think you ought to get some help, and statements at the same
 (16) times Mr Graves was investigating, judging from the date of
 (17) the report, so you didn't self-identify, no Ask him
 (18) What's interesting is he didn't tell us about Tompkins We
 (19) had to wait until the end of the trial Captain Hazelwood gets
 (20) caught
 (21) Now what should happen - let's see the Graves report
 (22) next, too
 (23) Then we have a formal report Now, Captain Hazelwood
 (24) denies all of this like everybody who comes in here, denies
 (25) everything They deny that the boat hit the rock
 (26) I asked Joe if he ever drank aboard ship He did, he came
 (27) back from port drunk on several occasions Firing offenses
 (28) Hazelwood told Tompkins he was in treatment for

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(1) alcoholism The chairman of the board of Exxon Corporation,
 (2) Larry Rawl, testified if Hazelwood was caught it was a cause
 (3) for termination This is a pretty serious thing
 (4) The conclusion, he was caught and he should have been
 (5) disciplined He wasn't disciplined My question for you is
 (6) is approving his conduct by not disciplining him safe or
 (7) reckless? It's reckless
 (8) Let's go on over his return to duty Could we have the
 (9) IDR? Let's see the next one whatever the next one is
 (10) The Exxon defendants have stipulated - and this
 (11) stipulation has been read to you - senior management knew in
 (12) May of '85 shortly after his discharge, that Captain Hazelwood
 (13) admitted in the past he had consumed alcohol and he had
 (14) returned from a ship - from port drunk several times This is
 (15) the key thing Such conduct constituted a clear violation of
 (16) Exxon Shipping Company's prohibitions against the use of
 (17) alcohol and/or intoxication aboard Exxon vessels They have
 (18) stipulated, and a stipulated fact is binding on you that it was
 (19) a clear violation of their policies They've stipulated to
 (20) this Why wasn't he fired? Safe or reckless? Why wasn't he
 (21) disciplined? Safe or reckless? Reckless
 (22) Now let's look at the IDR and when we look at the IDR, I
 (23) went back - the IDR was filled out by this Dr Vallury I
 (24) went back, Dr Vallury testified here by deposition - and I
 (25) hate to admit it but you may have slept through it, it was a

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- (1) read deposition
- (2) So it was your view -- this question was asked to Dr
- (3) Vallury Hazelwood's doctor So it was your view then that
- (4) Captain Hazelwood should remain alcohol free for the rest of
- (5) his life on discharge? Yes I am talking generally, that
- (6) again what I generally practice would apply to him logically
- (7) Again specifically, what I said to him at that time I don't
- (8) recall
- (9) What do you generally practice then, a lifetime of
- (10) abstinence from alcohol
- (11) That's what Dr Vallury, who filled out this said about
- (12) it Now this fight over the 30 4 and the order of these two
- (13) things what does Dr Vallury say about that, the guy who
- (14) filled it out -- not everybody else after the fact if I might
- (15) clarify -- to me, in treating a patient it's not that
- (16) significant
- (17) Now, let's just talk about -- this is you know in the
- (18) opening they described what Captain Hazelwood suffered from
- (19) as
- (20) something that the Wall Street Journal describes as the blues
- (21) He was in a psychiatric hospital for 28 days with prescribed
- (22) aftercare and one of these numbers includes the following and
- (23) I'm going to read the same way that I tried to read it with
- (24) that doctor who came in here the one from the National Council
- (25) on Distillers or wherever he was from The need for daily use
- (26) of alcohol for adequate functioning, the inability to cut down

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- (1) or stop drinking repeated efforts to control or reduce excess
- (2) drinking by going on the wagon occasional consumption of a
- (3) fifth of spirits or its equivalent in wine and beer Amnesic
- (4) period for events occurring while intoxicated Continuation of
- (5) drinking despite a serious psychological disorder Drinking of
- (6) non beverage alcohol That is what the number is associated
- (7) with
- (8) Now in consideration of this document, in this document
- (9) Exxon is put on notice that he has to go to individual therapy
- (10) group therapy marital therapy, Alcoholics Anonymous and
- (11) lectures on alcoholism It's right there in the document
- (12) They're on notice of this, and then they go ahead in
- (13) Exhibit 745 they capture the information again and describe it
- (14) as alcohol treatment ALC treatment and now it's what the Wall
- (15) Street Journal calls the blues
- (16) Dr Montgomery testified -- Dr Montgomery is up here
- (17) testified and I went back and checked the transcript that the
- (18) decisions with regard to Captain Hazelwood were made even
- (19) before he got back to line management And in his words it
- (20) hacked him
- (21) Now Montgomery who everybody relied on -- and I'm moving
- (22) now to the fitness for duty determination -- who everybody
- (23) relied on to make the fitness for duty determination did it on
- (24) the basis of one five minute phone call that he can't
- (25) remember And he knew that alcoholism was a disease for life

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- (1) that the 28-day program was a term of art for rehabilitation
- (2) that you needed updated medical records that the nature of the
- (3) occupation of a ship captain did not provide for Alcoholics
- (4) Anonymous, that there was no good reason not to give him a
- (5) shoreside assignment, that rumors of drinking may indicate a
- (6) serious problem
- (7) And Dr Montgomery knew how to monitor somebody because
- (8) I
- (9) asked him, there was a guy who worked for him that he
- (10) monitored who he dealt with directly, who he talked to about
- (11) his problems, who he talked to about his home life, who he
- (12) talked to about his aftercare and follow up
- (13) Dr Montgomery did all of that, but what he didn't do was
- (14) get a complete set of medical records talk to Hazelwood,
- (15) document the fitness-for-duty determination did nothing about
- (16) aftercare, did nothing about AA Dr Montgomery put this man,
- (17) coming back out of an alcohol rehabilitation program, back into
- (18) duty on the basis of a five minute telephone call that he
- (19) didn't record, that he didn't write down, and who does he
- (20) blame? Well, he says, Well, I talked to Dr Vallury so it must
- (21) be Dr Vallury's fault, or Mr Graves never gave me the Graves
- (22) report so it must be his fault And with regard to what
- (23) happens thereafter no one came to him regarding rumors so it
- (24) wasn't his fault No one asked him about monitoring
- (25) Now, Dr Masters who was the only expert to testify in
- (26) this courtroom about what ought to be done testified as

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- (1) follows We should have formal return to work procedures
- (2) including contracts, interviews and follow-up Medical
- (3) department should do monitoring afterwards, safety-sensitive
- (4) people present specific problems and there should be
- (5) procedures
- (6) for people in safety-sensitive positions People in
- (7) safety sensitive positions have to participate in aftercare
- (8) There has to be regularly scheduled meetings between the
- (9) supervisor and the rehabilitated employee to talk to them
- (10) honestly and openly about what's going on in his life And
- (11) they ought to discuss aftercare
- (12) Exxon had no policies for any of these things And they
- (13) didn't try to do them
- (14) Now, Exxon will come in and say Well, this Dr Masters was
- (15) talking about the airline industry He wasn't talking about
- (16) the airline industry He was talking about industry in
- (17) general And it's kind of interesting because when Dr
- (18) Montgomery has to supervise somebody by himself that works
- (19) for
- (20) him, how does he do it? He does it like this
- (21) Do you recall we played a deposition of a fellow named
- (22) Jerry Aspland from Arco Marine? Played it early on He's the
- (23) president of Arco Marine His equivalent Jerry Aspland has
- (24) an alcoholic tanker captain who goes through treatment What
- (25) does Jerry Aspland at Arco Marine, their sister company, do?
- (26) Right by the numbers And does he say, I didn't do the
- (27) monitoring, heck I'm the president? He doesn't say that He

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(1) rolls up his sleeves he knows a tanker captain is an important
 (2) safety-sensitive position and that safety is important to
 (3) society and this is what Jerry Aspland does Thank you
 (4) Dr Gould, who came and testified rehabilitation is an
 (5) ongoing life situation Alcoholics suffer loss of cognitive
 (6) acts but do not suffer any signs of gross motor impairment
 (7) Abstinence is desired, aftercare is important 305 02 is
 (8) alcoholism Is that our guy? Exxon
 (9) Exxon s Dr Nealy Relapse rate is high, recommends
 (10) abstinence Once alcoholic never back, no social drinking
 (11) Post rehabilitation testing helps You need six months to two
 (12) years of aftercare Dr Nealy was the one that left to set up
 (13) his own clinic or work at another clinic, he had a discussion
 (14) with Dr Montgomery after the grounding where Montgomery
 (15) was concerned about no paper trail, and Dr Nealy did recommend
 (16) an aftercare program in the company and it was squashed by Dr
 (17) Gould as not medical's problem These guys knew what they
 (18) were supposed to do They knew how to do it
 (19) So Captain Hazelwood is certified fit for duty on the basis
 (20) of one five-minute phone call with an awareness of his
 (21) potential risk to the public, and I ask you, is that safe or
 (22) reckless? It s reckless
 (23) Exxon Shipping Company s return to work Tompkins is the
 (24) Gulf Coast fleet manager And he knew - that s Mr Tompkins
 (25) right here - about the February 85 investigation because Ben

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(1) Graves told him about it, but he did nothing to find out about
 (2) what the substance of it was He knows that Hazelwood was in
 (3) for alcoholism because that's what Hazelwood told him He
 (4) knew that Hazelwood couldn t drink period That s what he
 (5) testified to He knew drinking was a downhill slide He knew
 (6) AA would be a problem and he knew that the medical
 (7) department was available to him, but he never talked to them What does
 (8) he do, Tompkins? Returns him to work, 99-day tour of duty, no
 (9) AA no aftercare
 (10) What he didn't do when he met with him Talk with him
 (11) openly and frankly Like many other Exxon Corporation
 (12) executives, Tompkins had two stories He tries to pawn off
 (13) that he did talk to him but when he s cross-examined and
 (14) confronted with his private testimony, he says I didn't talk
 (15) to him
 (16) Tompkins never spoke to the medical department He never
 (17) followed up on the February investigation He didn't give him
 (18) a shoreside assignment and he didn't set up a monitoring
 (19) program He said he thought about it but he didn t set one
 (20) up
 (21) Sheehy, port captain He knew drinking problems alcoholic
 (22) rehabilitation He knew it was work-related He knew
 (23) follow-up was necessary there is a fair likelihood that
 (24) someone with an alcohol problem would start drinking again
 (25) and this is something to be concerned about He saw the movie,

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(1) everything looks so normal he knew about masking What he
 (2) did, Captain Sheehy had a beer at the macaroni and-cheese
 (3) bar
 (4) at the hotel
 (5) This is - this man is coming back from alcohol
 (6) rehabilitation This is his first meeting with his company
 (7) coming back from alcohol rehabilitation This isn t anything
 (8) but a cocktail lounge
 (9) Now when I had opened, I said it was a bar because that s
 (10) what these guys had testified to This is worse and let me
 (11) tell you why Alcohol open Let s sit down in front of this
 (12) bar with people sitting around us and have an open sensitive
 (13) discussion about your alcoholism And maybe the people at
 (14) the table next to us can join in
 (15) Thank you
 (16) Sheehy talked to Pierce twice And Pierce told him that if
 (17) he didn't stop drinking he would be fired, that this was his
 (18) last chance, that it interfered with his job performance And
 (19) what did Sheehy not do? Didn't talk to him openly and frankly
 (20) didn t ask about aftercare didn't inquire into the details of
 (21) aftercare, didn't work on accommodating aftercare
 (22) Frank Iarossi, another Exxon executive that can speak out
 (23) of both sides of his mouth His first emotional reaction when
 (24) he finds out about Joe being returned to duty is, Don t put him
 (25) back on the ship, we've got a problem here He had to be
 monitored with regard to falling off the wagon Any return to

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(1) drinking presented a problem
 (2) Iarossi knew he couldn't be monitored at sea He admitted
 (3) it The risk of Hazelwood's continued use of alcohol brought
 (4) up the question of safety of the vessel and the environment
 (5) We knew the risks Frank Iarossi
 (6) The treatment was alcohol abuse He knew Hazelwood was in
 (7) AA The company policy was that a request for rehab made
 (8) after
 (9) discovery of the violation, if you get caught that results in
 (10) discipline Hazelwood wasn't disciplined and Iarossi knew
 (11) about the concept of denial What did Iarossi do? With regard
 (12) to the reassignment he did nothing because he wasn't told until
 (13) after the fact Now he claims that he weighed this decision -
 (14) and this is the big, big, big defense, that Frank Iarossi had
 (15) these competing concerns, to promote self-identification,
 (16) didn't want to get sued, versus the public safety The man was
 (17) caught
 (18) Iarossi didn't know about his reassignment to the vessel
 (19) until weeks after the reassignment Frank Iarossi is not being
 (20) frank with us And Frank Iarossi knew the risk to the public
 (21) Frank Iarossi should have known the man was caught It s his
 (22) company
 (23) And he didn t go and look at the IDR and he didn t check
 (24) into whether there was a fitness-for-duty determination in the
 (25) file, and Frank Iarossi is Mr Blame He says, Well, Graves
 gave me this legal advice Well, the very last tape that we

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- (1) played in our rebuttal case was Ben Graves saying, I didn't
 (2) give you any legal advice He blames Tompkins and Sheehy
 for
 (3) not telling him at the time of the assignment He says he told
 (4) somebody to make a fitness for duty determination, Tompkins
 or
 (5) Sheehy They never did so Frank's saying it s their fault
 (6) Unfrank Frank Tompkins and Sheehy should have checked to
 make
 (7) sure he was out of the denial stage, and you don't beat around
 (8) the bush
 (9) That s what the plaintiffs have been saying for four
 (10) weeks That s what Iarossi says, but he doesn't check to make
 (11) sure that happens, Tompkins and Sheehy don t do it Iarossi
 (12) lies about self-I D He comes in here and tries to sneak by
 (13) the self-I D thing, but at the time he testified at his
 (14) deposition Frank Iarossi testified he didn t know one way or
 (15) the other he self I D d
 (16) His deposition was taken before the party line was put into
 (17) place Frank Iarossi risked the public because of his
 (18) laziness his laxness, his inattention to detail He risked a
 (19) catastrophic oil spill He knew that that was a result of this
 (20) kind of activity and then he boldly talked about the risk of a
 (21) lawsuit by somebody who got caught versus the public's safety
 (22) The public s safety? Hazelwood testifies that at the time he
 (23) was reassigned on the Gulf Coast, there was a shortage of ^少
 (24) masters I submit to you, that's what happened
 (25) Well, Joe s got a problem but we re short on masters so

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- (1) let s take the easy way out What do Rawls and Raymond, two
 of
 (2) the most powerful people in the world say about the decision
 (3) what do they say about the decision?
 (4) Mr Rawl how is it that Exxon - which trains its captains
 (5) as you just said - didn't pick up Captain Hazelwood s drinking
 (6) problem? He d gone through a rehabilitation program and his
 (7) mother says that Exxon knew about that
 (8) I think - and I of course am sort of after the-fact, but
 (9) Exxon did know about the rehabilitation and I think we made a
 (10) gross error
 (11) Mr Raymond It was not a good policy to leave a man with
 (12) this substantial record of alcohol abuse in command of a tanker
 (13) filled with oil You don t - you don t need to be a genius to
 (14) figure out that one
 (15) Consciously taking a chance to cause an accident is what
 (16) Mr Lynch described as recklessness in his opening
 (17) The conclusion Graves Rouse and Rawls all say that
 (18) Hazelwood could have been given a shoreside assignment He
 (19) could have had Pierce's job Hazelwood was never told not to
 (20) drink Hazelwood was never properly evaluated Exxon knew
 the
 (21) tremendous risk The decision to return him to a ship was made
 (22) without care, it was a gross error in judgment To use another
 (23) one of Mr Rawl's phrases, it was an error on a going in
 (24) basis
 (25) Safe or reckless?

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- (1) Monitoring on the Gulf Coast next topic Iarossi said
 (2) that any return to drinking - it s a different story than we
 (3) get now, but Iarossi said his understanding was any return to
 (4) drinking would result in termination Now it s okay to drink
 (5) but at least Frank says any return to drinking on the Gulf
 (6) Coast would return - would result in termination Hazelwood
 (7) as of '86 returned to drinking and Hazelwood testifies I drank
 (8) openly, didn't hide it from anybody drank at - you know, it
 (9) was no big deal, nobody told me I couldn't drink
 (10) Tompkins thinks he may have visited him one time but he
 (11) isn t sure There was no monitoring plan in place when he
 (12) left
 (13) Sheehy was on notice of the problem, knew that relapse was
 (14) likely Sheehy says no one told him to monitor You know all
 (15) of these people, there is not one person - Borgen Martneau,
 (16) Myers, Graves, Paul, Paul, Tompkins, Leyendecker Tompkins,
 (17) Koops Sheehy - nobody told any of them to monitor How do
 (18) you have a monitoring program if nobody was told to monitor
 (19) They say, Well, I sort of picked it up from on my own, from a
 (20) strange undercurrent Nobody told - all of these guys said,
 (21) Nobody told me to monitor
 (22) There was no monitoring program
 (23) Sheehy knew that relapse was likely Doesn t know about
 (24) anybody else who watched Hazelwood There was never a
 (25) conversation with Koops where Hazelwood was discussed more

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- (1) closely than anybody else Hazelwood had poor ratings Talk
 (2) about your job performance, and he never talked to Hazelwood
 (3) about aftercare rehabilitation
 (4) Koops who takes over from Tompkins on notice of the
 (5) problem, it was bad news I had a captain with a drinking
 (6) problem If he starts drinking, things will probably go pretty
 (7) fast He knew about denial Koops knew about denial and that
 (8) alcoholics had to admit that they were alcoholics in order to
 (9) be cured He never talked to Hazelwood about any of his
 (10) problems Not in a New York minute No New York frankness
 out
 (11) of Mr Koops, I ll tell you that
 (12) With the exception of one conversation with Sheehy he
 (13) never talked to anyone about whether Hazelwood had resumed
 (14) drinking
 (15) Dan Paul Paul testified that he before 1985, had
 (16) unsuccessfully tried to monitor Hazelwood Paul testified that
 (17) he tried before unsuccessfully Exxon knew that they had a
 (18) problem
 (19) The conclusion with regard to monitoring There was no
 (20) monitoring There was no system there was no paper And
 (21) recalling today what happened back then there was no
 honesty,
 (22) everybody sort of trying to cover their behinds a little bit
 (23) Safe or reckless?
 (24) The Shaw incident Jim Shaw, the port steward Now this
 (25) great confidential secret they're going to come in and talk

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- (1) about confidentiality Everybody in the fleet knew that he
 (2) went through rehab Everybody in the fleet knew he was
 (3) drinking Jim Shaw, the port steward, comes in he knows
 (4) Hazelwood's been through alcohol rehabilitation
 (5) This is the first of many people they will dump on They
 (6) dump on people who have no reason to lie They'll come in and
 (7) they'll dump on Jim Shaw because Jim Shaw won't help the
 party
 (8) line Shaw had four different incidents including one in which
 (9) there were parties on board the vessel And he reports this to
 (10) Captain Sheehy, Kimberly Case, Ellen Share Sam Pierpoint,
 (11) Koops, Leslie Pennington and he uses words like drunk and
 (12) falling off the wagon Exxon is on notice relapse
 (13) What happens? You can't tell from the testimony, but Shaw
 (14) gets called on the carpet in Koops' office A thing that you
 (15) could conclude from what Mr Koops said is Shaw got called on
 (16) the carpet in Koops' office and pressed about what happened,
 (17) maybe scared not to talk about it
 (18) Shaw is an Exxon employee Two witnesses have called him
 (19) an honest man They're going to try to dismiss him as a
 (20) gossip He had never gossiped about people drinking He had
 (21) four specific incidents Ellen Share called him an honest man
 (22) and what didn't they do?
 (23) Koops said if Mr Sheehy did not talk to the witnesses and
 (24) the participants, he would be remiss in his duties Nobody
 (25) talked to Hazelwood about what went on on the vessel, nobody

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- (1) interviewed him or confronted him
 (2) Sheehy didn't - Koops, I asked Mr Koops about confronting
 (3) the individual directly It is both good management and a part
 (4) of being a decent human being They never did that Why?
 (5) Because they didn't want to know
 (6) Sheehy didn't interview the witnesses, he didn't interview
 (7) Hazelwood There's no documentation Then they have
 (8) Mihajlovic come in and testify that he visited Hazelwood on the
 (9) vessel Now that's a very interesting story with regard to
 (10) two aspects of it
 (11) The first aspect of it is Mihajlovic is the only witness
 (12) who came in here and said he wouldn't have been on the
 bridge
 (13) Mihajlovic came in here as a friend of the captain's
 (14) The second thing is Mihajlovic said he visited Hazelwood
 (15) and Hazelwood made light of the problem and blew it off and
 (16) said, Search my room So that was no planned search I mean
 (17) we don't know whether the search took place we know at a
 (18) minimum it wasn't a planned search and we know that
 Hazelwood
 (19) took it lightly He had returned to drinking and took it
 (20) lightly
 (21) The conclusion on the Gulf Coast with regard to monitoring
 (22) is that - with regard to the Shaw incident - is that less
 (23) than one year out of treatment, knowing about relapse, knowing
 (24) they should interview Hazelwood and the witnesses knowing
 the
 (25) risk to the public they botched it or they don't want to find

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- (1) out and I ask Is that safe or reckless Are all of these
 (2) things together safe or reckless?
 (3) They start to accumulate after a while
 (4) The transfer to the West Coast, over here - here's the
 (5) shadow remember him?
 (6) Andy Martineau testified that Exxon needed pilotage They
 (7) were paying a thousand dollars extra per ship for vessels
 (8) without pilotage Dan Paul's memo said 4500 Martineau
 (9) knew - he was by videotape - that Hazelwood may have had a
 (10) problem with drinking or alcohol and Martineau knew that it
 (11) would be dangerous to assign a master to a vessel where the
 (12) master may have an alcohol problem
 (13) What Martineau didn't do, he did nothing to determine
 (14) whether the rumors were true He didn't know about or follow
 (15) up about rehab He denies what Sheehy told him about going
 (16) through rehab Martineau was under the mistaken impression
 (17) that Hazelwood had high performance ratings and he didn't
 (18) consider transferring somebody else to the Valdez who didn't
 (19) have pilotage because it would cost Exxon extra money
 (20) Martineau tries to put the blame on Sheehy, and Andy
 (21) Martineau in his deposition says something relevant real
 (22) real, interesting The people who knew Hazelwood had a
 problem
 (23) and knew about his rehab were making the final decision
 (24) Somebody else's problem
 (25) Harvey Borgen knew that Hazelwood had a problem and that it

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- (1) was important that he not drink Borgen doesn't talk to human
 (2) resources, doesn't talk to medical, doesn't talk to somebody
 (3) about monitoring, doesn't talk to someone about aftercare and
 (4) most importantly, doesn't talk to Hazelwood
 (5) Koops does not tell Borgen that Hazelwood had to be
 (6) monitored and Borgen doesn't tell Koops that he was going to
 (7) set up a system
 (8) Sheehy tells Martineau, with regard to the transfer, that
 (9) Hazelwood's performance was above-average, which is untrue
 (10) And that there were no signs of drinking And then Sheehy sort
 (11) of equivocates on the Shaw incident
 (12) Big Frank finds out after the fact and is shocked Frank
 (13) always finds out after the fact and he's always shocked and
 (14) does nothing
 (15) The conclusion is, to save a thousand bucks a trip, let's
 (16) put a relapsed alcoholic on the bridge of a supertanker Safe
 (17) or reckless?
 (18) West Coast monitoring Myers had bad vibes, Myers had bad
 (19) vibes, Shaw had bad vibes, and Pierce had bad vibes - bad
 (20) vibes Went to Borgen and Borgen whispered - in the typical
 (21) Exxon Corporation way, he whispered alcohol dependent
 Myers
 (22) knew he doesn't drink, that he had emotional problems that he
 (23) had to abstain, that a drinking alcoholic captain presented a
 (24) risk to the vessel and the environment around it And Myers
 (25) says, The only people that I knew that were monitoring

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- (1) Hazelwood -- nobody told us to do it -- were me and Borgen
- (2) Shearer and Larson s name don t pop up
- (3) What he didn t do -- there s no documentation about
- (4) Hazelwood and this transfer He never talked to Hazelwood
- (5) about drinking, AA follow up During the whole two years
- (6) Borgen never talked to him Martineau never talked to him
- (7) Myers equivocates whether he talks to him Never talked to Ron
- (8) Lund from Alamar
- (9) Remember Ron Lund? Hazelwood had a reputation among Alamar
- (10) as a person sailor who liked to drink He had a reputation
- (11) among the fleet
- (12) They never went over to human resources or the medical
- (13) department to set up a monitoring program Borgen says he was
- (14) never told by Frank Iarossi, doesn't mention it one way or the
- (15) other
- (16) There's no discussion concerning Hazelwood s past, no
- (17) question concerning setting up a program no structure of a
- (18) program no writing of a program What conclusion do you
- (19) draw?
- (20) So Myers and Borgen know that he shouldn t drink know that
- (21) there should be a system set up, don t talk to Hazelwood about
- (22) anything, don t talk to anybody about anything and then we
- (23) have Larson and Shearer at the bottom of the totem pole and
- (24) come in and say they monitored his paperwork They ^{is} monitored
- (25) his paperwork When he came back we made sure that his

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- (1) paperwork was neat and his paper work was superior
- (2) Well his ratings for his paperwork say it was at any
- (3) time superior but you don't help an alcoholic by checking his
- (4) paperwork
- (5) Iarossi I don t supervise monitoring, I'm the president
- (6) The Portland Shipyard incident Now, the people who report
- (7) these things and who are now liars are all at the bottom of the
- (8) totem pole This is sort of the Exxon reaction Let s dump on
- (9) the guys at the bottom of the totem pole because they don't toe
- (10) the party line
- (11) In Portland Hazelwood drank with Stalzer Donald Kimtis,
- (12) Carr and Cousins On the vessels in a restaurant and in his
- (13) apartment And he drank beer, wine and hard liquor
- (14) Hazelwood admits that he talked over the walkie talkie and
- (15) he admits drinking beer, wine and vodka and he also says I
- (16) told Herb Leyendecker from Mecca And he also said, I told
- (17) Paul Myers that I was drinking
- (18) Now Hazelwood had four different versions of this Four
- (19) different versions of this
- (20) Steve Day He sees Henry s bottles in two different
- (21) locations which confirms what Nate Carr says We were drinking
- (22) on the vessel
- (23) Here s the walkie talkie Carr says I drank on the vessel
- (24) with Hazelwood Cousins says I drank back in Joe s room
- (25) Stalzer says Hazelwood had two vodkas while waiting for the

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- (1) luggage Waiting for the luggage ought to take less time than
- (2) 25 minutes The amount of time that they were in the Harbor
- (3) Club He has two vodkas waiting for the luggage
- (4) Stalzer s alternate captain Day reports this to Myers
- (5) twice Now, what does Myers do? He goes to see Borgen and
- (6) he's shocked Everybody here is shocked but nobody here does
- (7) anything Goes to see Borgen and Borgen says Well, I talked
- (8) to Leyendecker about it over the telephone
- (9) Borgen s entire follow-up on this thing is what he says
- (10) Leyendecker told him He doesn t talk to Joe he doesn't
- (11) investigate This is the boss This is the boss
- (12) I asked Mr Koops -- and this is always an interesting
- (13) thing to do -- what Mr Koops would have done with regard to
- (14) the hypothetical of the Portland Shipyard Talk to the suspect
- (15) direct and forthright, talk to the witnesses and those on the
- (16) ship
- (17) The Mary Williamson incident, coming over on the launch
- (18) Hazelwood appeared drunk She reports it to Day despite the
- (19) fear of unofficial retaliation Day reports it to Myers
- (20) something is going on with Joe, Myers needs to be aware
- (21) This incident takes place a week or so before the
- (22) grounding Last clear chance on notice we have a problem
- (23) And Myers denies it because this would put him in complicity
- (24) with what went on But what does Myers say about it if it
- (25) would have happened?

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- (1) If it would have happened and he didn't act on it that
- (2) would be reckless, wouldn t it? Well yeah I would be a bad
- (3) boy
- (4) Reckless? No question
- (5) My question for you Is safe or reckless?
- (6) Now, if I was -- if a reasonable person was in charge of
- (7) monitoring Hazelwood on the West Coast and you wanted to get
- (8) him so you didn t have to go to Long Island or New York or
- (9) where he was living what are the two most obvious places that
- (10) he would drink The Yankee Whaler in Long Beach and Valdez
- (11) And you wouldn t have had to do anything difficult other than
- (12) come up and ask your agent in Valdez at Alamar about the
- (13) captain or go have a couple beers with the guys over at the
- (14) Yankee Whaler and find out
- (15) The conclusion We have covered the hierarchy of the
- (16) company They all knew that there was a problem and none of
- (17) them did anything
- (18) Why is Davis up here, the attorney? Davis got the Graves
- (19) report All of these people knew, notice of his drinking, his
- (20) drinking problem at the highest levels Is it safe or reckless
- (21) to ignore a problem waiting to happen?
- (22) Now while the so-called monitoring was going on -- and
- (23) there wasn't any monitoring going on if there was Exxon
- (24) Corporation would have it written down and we would have
- (25) seen it

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- (1) Hazelwood admits that he had a drinking problem, that he
 (2) had four or five doubles before dinner wine, couple after He
 (3) wasn't blotted Drinking pattern of an alcoholic He lied to
 (4) his wife and others He had a faulty memory He drank too
 (5) much but continued drinking He got caught He claims he was
 (6) never told what his diagnosis was
 (7) Gould O Connor, Nealy and Vallury all say he shouldn't
 (8) drink four doctors There was a recommendation that he not
 (9) drink He quits aftercare, he's in AA for 90 days Alcoholics
 (10) who are binge drinkers are very dangerous Dr Nealy
 (11) testified
 (12) He leads a double life At home he goes to AA and his wife
 (13) goes to Al-Anon He doesn't drink But he resumes drinking on
 (14) the road He has an AA sponsor that he talks with he has a
 (15) bar list in his room On the road he admits to drinking with
 (16) St Pierre, Dengel, Kunkel Sturgis, Carr, Cousins,
 (17) Masciarelli, Hogan, Roberson, Deckert, Kimtis Enright and
 (18) others, with Captain Enright in 1988 he has eight to ten drinks
 (19) and drives
 (20) Shaw sees him drinking four times There's the Portland
 (21) Shipyard incident, Mary Williamson incident Captain Stalzer
 (22) testifies there were parties in the quarters Enright saw him
 (23) in the quarters appeared he had been drinking Carr, they
 (24) drank aboard the boat
 (25) He drinks with Cousins he drinks with Kunkel Alamar

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- (1) drops him off and picks him up at bars These are all people
 (2) that are here because they drank with him And it goes on and
 (3) on and on
 (4) Could I see that next board? So your policy of knowing the
 (5) risk to the public of the catastrophic potential results of a
 (6) supertanker accident allow a relapsed alcoholic to command a
 (7) supertanker
 (8) Yes sir that's possible under our policy
 (9) Safe or reckless? In light of what we know safe or
 (10) reckless?
 (11) Is he a manager? I don't want to talk long about it
 (12) because I've got other things to talk about What does the
 (13) Exxon expert say about Captain Hazelwood and whether he is a
 (14) manager? A captain's job or ship master's job is perhaps one
 (15) of the most unusual in the United States You could say he has
 (16) to be the chief executive officer or the chairman of his own
 (17) company We asked a lot of people about this topic, and I'd go
 (18) over to the ship and say this is a business and the captain
 (19) manages it do you recall that? This summarizes it out of
 (20) Mr Bolton's mouth
 (21) Fatigue Dr Dinges came in and testified about fatigue
 (22) and the sleep guys acknowledged that Dinges was an expert in
 (23) the area and there were a series of Exxon policies that Exxon
 (24) says contributed to fatigue - or Dinges says contributed to
 (25) fatigue, including this series which he testified to and

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- (1) this, and there was that huge board - remember that huge
 board
 (2) in two pieces that Dick Gerry and Dinges went over where they
 (3) analyzed all the mates and whether they were in compliance
 with
 (4) the six on/six-off rule and they compared it to their
 (5) deposition testimony and their trial testimony These factors,
 (6) these policies of Exxon's DESCRIBED a situation in which all of
 (7) the Exxon Valdez mates who were available that night, the night
 (8) of the 23rd, were fatigued And all of them were in violation
 (9) of the federal six-on/six-off, which was the statute passed by
 (10) the Congress in about 1911 for the sole purpose of making sure
 (11) that we didn't have tired mates on watch on American vessels
 (12) And Carr and Masciarelli testified in a way in which one
 (13) could conclude that Exxon routinely sailed in violation of
 (14) 8104 six-on/six-off, and there were no policies in place to
 (15) ensure compliance with six-on/six-off Fatigue on the evening
 (16) of the 23rd caused Cousins, when he was up there alone, to
 (17) return to doing what he knew how to do, which was to go back
 (18) into the chart room and plot rather than pilot
 (19) Hazelwood's alcohol consumption on March 23rd of 1989 -
 (20) now once again, we have Lisa Harrison, Janice Delozier, Erma
 (21) Lee Roberson and Glowacki who all testify about what
 happened
 (22) and Exxon, as it's prone to do will dump on the three who are
 (23) not Exxon employees but in fact who were the three who have
 no
 (24) reason to lie
 (25) The size of the drinks, Lisa Harrison testified they were

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- (1) doubles and when Glowacki was on the stand we got from him
 (2) the testimony that he was drinking gin and-tonics in the same
 (3) size glass as Hazelwood was drinking vodka Do you
 remember
 (4) that? Gin and tonics, vodka? So where the tonic was, in
 (5) Hazelwood's glass there was vodka They were big drinks
 (6) Lisa Harrison testifies that sometime in the early
 (7) afternoon Hazelwood was in the Pipeline Club and has a
 (8) double No reason to lie From 2 15 to four, Lisa Harrison
 (9) and Janet Delozier testified that he was in the Pipeline Club
 (10) drinking
 (11) Now this time they have come up with no other excuse for
 (12) He buys the flowers, the flowers are bought right across the
 (13) street from the Pipeline Now, this is also interesting
 (14) because we have two eyewitnesses that see him in there When
 (15) does he tell the Coast Guard in his interview that he is at the
 (16) Pipeline Club? 3 00
 (17) He admits to three drinks here This is where Erma Lee
 (18) puts him in there about seven and we know the taxi is back
 (19) there then, and at the Harbor Club where they have 25 minutes
 (20) and Hazelwood testifies Well, I only had time to drink half of
 (21) it in the 25 minutes or I may not have drunk it, sitting there
 (22) for 25 minutes 25 minutes is almost a TV program He has at
 (23) least one and his companion says could have been more
 (24) That's 14, maybe 15, maybe 16, because there's testimony
 (25) here that it was at least three

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- (1) Now in point of fact I don't think we'll ever be able to
 (2) run up an accurate number like an accountant could do on an
 (3) adding machine because alcoholics minimize how much they
 (4) drink
 (5) and corporations that are caught minimize what's happened
 (6) But
 (7) there was an awful lot of booze that went into that man that
 (8) afternoon an awful lot of booze
 (9) Thank you
 (10) Why did Hazelwood lie to the Coast Guard about his alcohol
 (11) consumption the afternoon of the 23rd? That's a good
 (12) question Was it reckless or safe for the Exxon Valdez to
 (13) leave the dock for the managing agent, Hazelwood, to have the
 (14) Exxon Valdez leave the dock when the mates were in violation
 (15) of
 (16) the six on/six off, when he was in violation of the four hour
 (17) drinking rule and when he'd been drinking all afternoon?
 (18) Reckless or safe?
 (19) What does Hazelwood - do we have what Hazelwood told the
 (20) Coast Guard? Lied He doesn't get any of it right
 (21) The most important job of a captain is the safety of the
 (22) vessel The vessel hit a rock
 (23) Hazelwood doesn't inform the VTC when he actually leaves
 (24) the TSS He gives the VTC incorrect information about his
 (25) speed On the VTC tape he slips and starts to say Baton
 (26) Rouge He leaves the bridge two minutes before the turn He
 (27) violated Exxon policies with regard to Watch Condition C He's
 (28) lost after the grounding, he doesn't know where he is he says

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- (1) north of Goose Island He lies to Myers and Delozier and
 (2) others about his post-grounding maneuvers or he's actually
 (3) trying to get the vessel off a rock There's confusion
 (4) regarding where the ice is and where the turn is He smokes
 (5) after the grounding He vomits about midnight
 (6) All of the Exxon people who see him claim that he was
 (7) okay But let's take a look at the people who aren't under
 (8) Exxon control
 (9) Murphy smells alcohol twice, Falkenstein smells stale
 (10) alcohol Delozier smells alcohol Lawn smells alcohol He lies
 (11) to Delozier regarding his alcohol consumption
 (12) I want to talk about the voyage Can we bring that board
 (13) up? Do we have the Cushing board? I'll use that one
 (14) This one if you could just hold this here for a minute and
 (15) bring it back I don't need it for long -
 (16) But at the time Hazelwood left the bridge - there was
 (17) confusion and this is how you know that This is Hazelwood's
 (18) version of the leading edge of the ice this is Cousins
 (19) version of the leading edge of the ice (indicating) Two
 (20) different versions Why? Because there's confusion
 (21) This is where Hazelwood and Cousins now say the turn was
 (22) supposed to be made Cousins and Hazelwood when they
 (23) were
 (24) interviewed by Delozier say it was made here It was to be
 (25) made here Why? Confusion
 (26) Thank you

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- (1) Leaving the bridge two minutes before the turn in dangerous
 (2) conditions and eight minutes before you were going to clear the
 (3) ice There's confusion there's ice Watch Condition C
 (4) Pilotage, Cousins says he's never done it before Greg
 (5) Cousins says, I've never done it before Hazelwood says, I got
 (6) the call at two minutes Cousins doesn't say that, Cousins
 (7) says, I called him when I started the turn Way down here
 (8) Stalzer Martineau, Sheehy Duncan and Bolton all say they
 (9) would have been on the bridge Kunkel Cousins, Jarossi, Rawl
 (10) and LeGrange all say it was wrong for him to have left the
 (11) bridge They're going to say - this is real interesting
 (12) They're going to say it wasn't Hazelwood's fault because, if
 (13) Cousins would have made the turn at the time, the grounding
 (14) wouldn't have happened, okay?
 (15) What's wrong with that? The law allows there to be two
 (16) causes or three causes, and if Hazelwood would have been on
 (17) the
 (18) bridge drunk or sober as he admitted or a sober captain would
 (19) have been on the bridge, the grounding wouldn't have
 (20) happened
 (21) That's clear If he would have been on the bridge, the
 (22) grounding wouldn't have happened
 (23) Drinking an alcoholic drinking all afternoon equals
 (24) sleepiness and poor judgment which equals leaving the
 (25) bridge
 (26) An alcoholic drinking all afternoon equals sleepiness and poor
 (27) judgment which equals leaving the bridge That makes sense
 (28) It accords with obvious our obvious common experience

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- (1) They're in the danger zone He could have waited two minutes
 (2) he could have waited eight minutes, he could have waited ten
 (3) minutes He has an interesting story about why - his story
 (4) about why he goes below changes, and it even changed when
 (5) he
 (6) wasn't on the stand but originally it was to do paperwork
 (7) And then it changes We need to come up with a better
 (8) explanation because paperwork sounds lame, so it was a
 (9) weather
 (10) report And then Bolton comes in and he testifies, Well, he
 (11) needed to make a decision to go to Knowles Head or something
 (12) like that Nobody ever testified before Bolton about Knowles
 (13) Head They made this story up as the trial went
 (14) Drinking equals poor judgment and tiredness, equals leaving
 (15) the bridge
 (16) Thank you
 (17) Could I see the next one? The Arco Brooklyn and the Arco
 (18) Juneau - this looks like a drunken stagger compared to theirs
 (19) but there's a couple of different things Their captains were
 (20) on the bridge They didn't go in the red zone, they didn't hit
 (21) Bligh Reef, but their captains were on the bridge
 (22) And from the time he left the bridge until all the way down
 (23) here - remember all those other track lines? - he could have
 (24) avoided it Remember all those other track lines? He could
 (25) have avoided it, if he would have been on the bridge Poor
 (26) judgment equals leaving the bridge
 (27) Here are, in summary form, different evidences of the fact

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- (1) that the captain was not operating at a hundred percent We've
 (2) gone over them a million times You want me to go over them
 (3) again? I mean we've been over them a million times The big
 (4) one, though is he turned the con over to Cousins in violation
 (5) of Watch Condition C and in violation of the pilotage
 (6) requirement
 (7) But there are a bunch of them here They try to explain
 (8) them all away One of the more interesting ones to explain
 (9) away is why does he tell everybody that he was trying to get it
 (10) off the reef when he was trying to keep it on the reef?
 (11) Now, you can have that either way If he was trying to get
 (12) it off the reef, that shows that he wasn't all there If he
 (13) was trying to keep it on the reef, both in the hours after the
 (14) grounding and in the interview with the Coast Guard and with
 (15) Mr. Myers and his telephone call to him he says, I was trying
 (16) to get it off the reef Something's wrong one way or the
 (17) other
 (18) And then after the grounding, Hazelwood tells Myers, it's
 (19) my fault, and Hazelwood tells Fox You're looking at it
 (20) And now let's go through their excuses
 (21) Thank you
 (22) We had to give him his job back, but they didn't have to
 (23) give him his job back He was caught and they didn't have to
 (24) put him back in the same job and they fired over 35 people for
 (25) drinking

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- (1) They couldn't monitor him because of confidentiality Give
 (2) me a break The statement is stupid It is a stupid statement
 (3) to say, I can't talk to you about your alcoholism problem
 (4) because of confidentiality There's nothing non-confidential
 (5) about talking to somebody about it, is there? Isn't that what
 (6) you do somebody comes back to work from alcohol treatment
 (7) and
 (8) you say Let's talk about it I mean, our common experience
 (9) tells us that's the first thing we would do
 (10) Montgomery monitored in a direct and open way Dr. Masters
 (11) has testified about it Jerry Aspland testified about it,
 (12) their policy allows it And the guidelines for masters
 (13) captains, managers and supervisors, on the second page there
 (14) is
 (15) a statement If the employee refuses to rehabilitation or fails
 (16) to respond to treatment the company will take appropriate
 (17) disciplinary action
 (18) How do you know if he's failing to respond to treatment?
 (19) By sneaking around? No, you know it by talking to him by
 (20) treating with him honestly and decently Their policies allow
 (21) them to monitor Iarossi says he should have been talked to
 (22) directly openly, frankly They whisper it and refer to it by
 (23) code name H Everybody in the fleet knew he had been
 (24) through
 (25) rehab and everybody in the fleet knew he was drinking
 (26) We monitored job performance The regulations, their rules
 (27) say, We monitor rehabilitation and thus we monitor job
 (28) performance in the case of safety-sensitive positions is an

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- (1) interesting concept, because you know what it means? Let's
 (2) wait until the airplane crashes or the boat runs aground and
 (3) then we have bad job performance and then we can fire him
 (4) and
 (5) the public be damned This is a company whose view is the
 (6) public be damned He's not an alcoholic That's absolutely
 (7) incredible He didn't have to be on the bridge, everybody says
 (8) he had to be on the bridge
 (9) There was no pilotage There was a pilotage requirement
 (10) Mr. Lynch in his opening said it was required Mr. Lynch in
 (11) his opening statement said pilotage was required and now a
 (12) couple of minutes - I started at 8:15 and in five minutes
 (13) wherever I am, I'm going to play you a tape, because the tape's
 (14) ten minutes long And in the tape, the first guy that you'll
 (15) see in the tape is Ulysses LeGrange All five of the people in
 (16) the tape are high Exxon corporate officials
 (17) You remember the first day we played Exhibit 2, the
 (18) videotape? And a lot of it went by me and may have gone by
 (19) you We're going to play it again now in three and a half
 (20) minutes to remind you of what these people said earlier and so
 (21) you can compare it to what they said in the courtroom In
 (22) fact we'll play it right before they argue
 (23) Blame it on Cousins, which is sort of like blame it on Mary
 (24) Williamson, blame it on Steve Day, blame it on Jim Shaw Now
 (25) let's blame it on Cousins Cousins admits he was out of his
 (26) element there was confusion on the bridge And leaving the

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- (1) bridge do we have a - yeah, Exxon admits that his leaving the
 (2) bridge was the cause of the spill This is a stipulated fact
 (3) You're bound by this stipulation You're also bound by
 (4) common
 (5) sense and the evidence, which goes into the stipulation The
 (6) Exxon defendants admit that the captain was negligent He was
 (7) also reckless That such negligence was a proximate cause of
 (8) the spill His leaving the bridge was a proximate cause of the
 (9) spill Causal connection You can't argue around it Okay?
 (10) And the judge will instruct you that something can have two
 (11) causes, so it could be Cousins' fault but it is certainly
 (12) Hazelwood's fault and it is certainly Exxon Corporation's
 (13) fault
 (14) The blood test I haven't talked about the blood test but
 (15) there's a real easy answer to the blood test
 (16) Can I have the Elmo?
 (17) All of this talk about whether it was one size or another
 (18) size seven versus ten and all of that, remember all of that?
 (19) First of all the only person to actually come in and testify
 (20) about the chain of custody was Dr. Smith and he said it was
 (21) fine, because there was no tube tampering But this is real
 (22) interesting
 (23) See all the initials on that? All the labels on it,
 (24) everybody's signature on it? It was never tampered with And
 (25) the instructions - Conner says he got the test tubes out of
 (26) the Exxon kit The instructions tell you what size the test

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- (1) tubes are Two sterile ten milliliter Vacutainer brand tubes
 (2) each containing preservative so we know that these are the
 (3) same tubes that got to the lab They got initials on them
 (4) You see right there where it says vacuum, where my finger is?
 (5) Becton Dickinson, same as the old paper off of the boat And
 (6) that they're ten milliliter test tubes is, interestingly
 (7) enough, right above the captain's signature
 (8) And I want to play the tape and I'm right in the middle of
 (9) what I was saying, but I'm going to stop and we'll play the
 (10) tape and then I'll visit with you in about two hours Okay,
 (11) would you play the tape?
 (12) (Videotape played, following)
 (13) MR RAWL Two critical regulations that you need to
 (14) know about Regulations require a local pilot on board the
 (15) vessel from the time she leaves the dock until she gets through
 (16) the Valdez Narrows and enters Prince William Sound Another
 (17) regulation requires that we have a pilot aboard the vessel
 (18) while she's transiting Prince William Sound Industry practice
 (19) has become we qualify our ship captain to be that pilot while
 (20) we transiting Prince William Sound So the master of the
 (21) vessel has a pilot's license for this portion of the journey
 (22) From time to time, someone will say that - not necessarily
 (23) the master, but someone has a drinking problem, and you'll
 (24) follow up on it and some amount of time there's some fire under
 (25) that smoke In this case we didn't have -

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- (1) (Change of setting still video)
 (2) You had no reports?
 (3) We had no reports on this, to my knowledge
 (4) The other question people are asking about Exxon is how in
 (5) the world could a captain with the record of this captain be in
 (6) charge of a tanker in these environmentally sensitive waters
 (7) and why was he not on the bridge at the time of this accident?
 (8) Well the last part is apparent He was drunk according
 (9) to his own - the indication certainly of the test Now in
 (10) terms of how that happened every tragedy that you and I ever
 (11) hear about there's two very unfortunate circumstances that the
 (12) odds would say wouldn't happen that happen This man
 (13) should
 (14) not have been back on the bridge after this treatment We do
 (15) have a policy however, that says if employees have a
 (16) problem - and I suppose every industry or most large
 (17) companies
 (18) have it - you try to get them into therapy, to recover but
 (19) certainly do not intend - and this policy doesn't say put them
 (20) back in critical skills jobs and we have not only ship
 (21) captains we have airplane pilots we have people that run
 (22) refineries and so forth This unfortunately should not have
 (23) happened
 (24) (Different setting, still video)
 (25) Q Was it good policy to leave a man with a substantial record
 (26) of alcohol abuse in command of a tanker loaded with oil?
 (27) A No, it was not a good policy When somebody comes
 (28) out of

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- (1) alcoholic rehabilitation he obviously is still a risk that we
 (2) all know, percentage-wise, there's a risk that he will not
 (3) recover and, under pressure, certain things can happen I
 (4) would guess that that's what happened here
 (5) (Different setting, still video)
 (6) Q Let's stipulate drunks shouldn't drive tankers and let's
 (7) get on to another question
 (8) A That's right.
 (9) This is something else Tests made sometime after the
 (10) grounding show the captain's alcohol limit was above limits
 (11) established by the Coast Guard That's clear, there are still
 (12) many unanswered questions as to what occurred during
 (13) this
 (14) period of time The Prince William Sound area is unusual,
 (15) that
 (16) most of the three mates plus the captain is licensed to pilot
 (17) this ship in many areas In Prince William Sound, as it's
 (18) been
 (19) said many times this morning, you have the state pilot takes
 (20) it
 (21) to a certain point and then the - can you hear me? I'm not -
 (22) in this case, the pilot - the pilot was also the captain
 (23) Obviously we had no knowledge of - or of how he was
 (24) impaired
 (25) I think it's possible, however - or as I understand the law
 (26) there, it's possible to have two mates on the bridge at the
 (27) same time in a case like this to where you could in fact do
 (28) what needs to be done when you have ice in one channel
 (29) and
 (30) there was a great deal of concern about the ice and so forth
 (31) I am not trying to make any excuses on this, but the facts
 (32) are

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- (1) there are ways to do that if in fact, as you suggested in
 (2) earlier conversation with Secretary Skinner, that if one had
 (3) a
 (4) heart attack or something - it just seemed kind of
 (5) ridiculous,
 (6) so there are other options available
 (7) Now the same impairment, apparently, that created the spill
 (8) to begin with created a situation where maybe the master
 (9) could
 (10) have said, Bring another mate up and have - they had -
 (11) they're actually, when the skipper was on the bridge, there
 (12) were four people There was a lookout on one of the wings,
 (13) there was a person that was in charge which then was the
 (14) captain There was the third mate who it was his shift and
 (15) there was also the man that was steering the vessel or the
 (16) person steering the vessel So that was the situation
 (17) Had when he went down, as I understood it, he could have
 (18) sent up another mate and be legally responsive Whether
 (19) or not
 (20) that ship would have hit the reef or not, I would expect it
 (21) would have had a much better chance of getting through
 (22) there
 (23) I've had a lot of difficulty understanding this accident
 (24) myself, I can assure you that
 (25) The judgment to put him back on the ship is a judgment
 (26) made
 (27) at a - at an operating level Obviously it was a bad
 (28) judgment, could have been a bad judgment in a lot of
 (29) people's
 (30) eyes on a going in basis, mine being one
 (31) But in any event, I just wanted to make that clear - in
 (32) case you hadn't heard of that, I didn't want you feeling like I

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- (1) didn't level with you when I was up here talking to you
When
- (2) we found out, however, there was alcohol involved and the
other
- (3) circumstances, we found out he violated a lot of policies, he
(4) was terminated
- (5) (Different setting, still video)
- (6) My own view is that that occurrence 200 000 barrels in
(7) Prince William Sound was viewed, quote, so highly unlikely
(8) that the consequences of it, which have occurred pretty well as
(9) much as envisioned were viewed as acceptable by today a
(10) retrospective view that is not the case That may be
(11) incomprehensible
- (12) Q Well it is -
- (13) A Senator, we have been in the past investigating the
(14) drinking habits of people, particularly individuals who have
(15) been through a rehab program
- (16) Q This man had been with you?
- (17) A Yes
- (18) Q How could you not know that he was a problem drinker if
(19) you put him through rehab program?
- (20) A Our policy, which is admittedly a two-edged sword, if you
(21) will, is to promote self identification, and rehab is the
(22) cornerstone, according to the experts The practice and the
(23) policy were followed in this instance What is required to
(24) make that work, I'll allow United Airlines practice if you
(25) will, is close follow-up after the individual returns

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- (1) DIFFERENT SPEAKER Frank would you comment on that?
- (2) A From the time that Captain Hazelwood returned from
(3) rehabilitation, he was the most closely scrutinized
individual
- (4) in our company
- (5) Q How is it Exxon - which trains its captains, you just
(6) said - didn't pick up Captain Hazelwood's drinking problem?
(7) He'd gone through a rehabilitation program and his mother
says
- (8) Exxon knew about that?
- (9) A I think, and I'm sort of after the-fact, but Exxon did know
(10) about rehabilitation and I think we made a gross error -
which
- (11) I'll guarantee you won't be repeated with that kind of
(12) rehabilitation We've got a program which says we'll give
(13) people a job It doesn't say we put them back to flying
(14) airplanes or piloting tankers or whatever other kinds of
really
- (15) risky kinds of activities we have, and there are a lot of them
(16) in any large business, but I frankly wish I had known or I
wish
- (17) some of the senior management in Exxon USA had known
- (18) (Different setting still video)
- (19) Q And that program did not detect his use of alcohol?
- (20) A No
- (21) Q Why do you think that was?
- (22) A I couldn't respond
- (23) Q After Captain Hazelwood's rehabilitation, the - the fleet
(24) operation manager and the ship group coordinator were
assigned
- (25) to make visits, and I believe you said about two visits a month

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- (1) when he was in port to observe him, I believe also to discuss
(2) his problems with him?
- (3) A Yes, and I think he felt he was the most scrutinized
(4) employee in our company I think he felt a little
(5) uncomfortable with it
- (6) (Different setting, still video)
- (7) Q I just want to be sure - and I don't know that one can get
(8) that assurance in a reasonable fashion in this setting at this
(9) time - that we're not going to find a week or a month or six
(10) months or a year down the road when the immediate glare of
(11) headlights and cameras and the inevitable short attention span
(12) of the American people and their media has relegated this
(13) somewhere to the background, that somewhere in some court a
(14) lawyer representing Exxon is going to suggest that the Coast
(15) Guard did not do all that they could or should have done and
(16) therefore at least some of the legal liability should fall on
(17) the government and the taxpayers of the United States rather
(18) than on the corporation
- (19) A Now, we - let me just put it this way in operational
(20) terms We - I'm sure, we've been in and out of there, there
(21) was something like 8800 voyages with tankers in and out of
that
- (22) harbor, we had a large percentage of them 20 percent of
them
- (23) or less, I guess We probably had bigger ships A large
(24) number of those times, we didn't expect any radar help and
we
- (25) didn't get any radar help, if that's what you're getting to

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- (1) right now, and, therefore, when we put that ship in there the
(2) last time and unfortunately didn't get it out of there, as far
(3) as the people that were running that company, Exxon
Shipping
- (4) Company, they didn't expect to have to rely on the Coast
Guard
- (5) to get them out of that harbor I said earlier, I think before
(6) you came in, that the weather was good and so on and so
forth
- (7) So if you're talking about that particular part of it, but
(8) you know, I feel a little uncomfortable just generalizations
on
- (9) this kind of thinking, but you - I'm trying to get across my
(10) intention, our corporate intention and the intention of the
company in Houston that's dealing with these ships
- (11) (End of video)
- (12) MR O NEILL That's all judge
- (13) THE COURT Ladies and gentlemen let's take our
(14) initial recess at this point so we won't have to divide up the
(15) other argument We'll be in recess for 15 minutes as soon as I
(16) hear from Mr Neal, I guess but you may leave
- (17) (Jury out at 9 45 a m)
- (18) (Side bar)
- (19) (Recess at 9 47 a m)
- (20) (Jury in at 10 01 a m)
- (21) MR NEAL Your Honor -
- (22) CLOSING ARGUMENT BY MR CHALOS
- (23) MR CHALOS Wait until I start Good morning
- (24) May it please the Court, counsel, Ladies and Gentlemen of

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- (1) the Jury If I were a member of the jury in this case the
- (2) primary question that I would want discussed is was Captain
- (3) Hazelwood impaired by alcohol on the night of the grounding
- (4) Everyone seems to acknowledge that this is the paramount
- issue
- (5) in this case Because I represent Captain Hazelwood and
- (6) because both he and I deeply resent the unsupported
- allegations
- (7) that have been made that he was impaired on the night of the
- (8) grounding, I've asked to go first
- (9) I want to - I wanted the opportunity to address you on
- (10) this issue and go through the evidence because, if he was not
- (11) impaired if he was not impaired on that night, it doesn't
- (12) matter whether Captain Hazelwood may have had an
- occasional
- (13) drink, social drink with his shipmates at the Yankee Whaler or
- (14) whatever the place was called or at some other place at some
- (15) other time It doesn't matter if Exxon's alcohol policy was
- (16) perfect or imperfect It doesn't matter whether Exxon should
- (17) have returned Captain Hazelwood immediately to a ship or
- given
- (18) him some shore leave and then returned him, and it doesn't
- (19) matter whether Exxon's monitoring was good or bad, perfect or
- (20) not perfect
- (21) I told you in my opening statement that there are two myths
- (22) in this case The first myth is that Captain Hazelwood was a
- (23) recovering alcoholic He was not The second myth was that
- he
- (24) was impaired on the night of the grounding He was not
- (25) In other words you remember the words of Commander
- McCall

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- (1) he was the highest ranking Coast Guard official in Valdez after
- (2) the grounding He said the allegation that Captain Hazelwood
- (3) had been drinking as far as being a cause of the grounding, is
- (4) just smoke That's all it is smoke I intend to take you
- (5) through the evidence and demonstrate to you that Commander
- (6) McCall was right when he said that five years ago and is right
- (7) today
- (8) Before I do that though, I want to blow up the first myth
- (9) that Captain Hazelwood was a recovering alcoholic
- (10) Mr O'Neill has preached to us now for a month he said
- (11) You cannot change the written word You heard him He said it
- (12) ten times if he said it once Well, ladies and gentlemen here
- (13) is the written word This is the IDR
- (14) Would you blow up the - you've got to do it on here?
- (15) This is Captain Hazelwood's diagnosis This diagnosis was
- (16) made by a well known and respected doctor in this field It
- (17) was not made by an attorney for the plaintiffs who has a stake
- (18) in this case This doctor diagnosed Captain Hazelwood as
- (19) suffering from dysthymia which is a mild form of depression
- (20) and secondarily from alcohol abuse episodic What that means
- (21) is prior to his treatment, Captain Hazelwood would on occasion
- (22) become depressed and he would abuse alcohol This is not a
- (23) diagnosis of alcoholism This is not a diagnosis of
- (24) alcoholism All the doctors that have come in here including
- (25) the plaintiffs' doctors had said - and they were reluctant

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- (1) but they said it this is not a diagnosis of alcoholism
- (2) Mr O'Neill and his colleagues getting up here and a
- (3) thousand times saying a thousand ways that Captain
- Hazelwood
- (4) was an alcoholic doesn't make him an alcoholic He was not
- (5) diagnosed an alcoholic and he's not an alcoholic
- (6) Plaintiffs' counsel tell you that anyone who ever goes
- (7) through medical treatment that involves some sort of alcohol
- (8) treatment with it can never drink again They say if he does,
- (9) what happens is he becomes an out of control, binge alcoholic
- (10) drinker who is going to pass out if he does it That's what
- (11) they told you And for sure they can never take on a
- (12) safety-sensitive job
- (13) But you know what? Their experts don't agree to that
- (14) They don't agree with either proposition They told you that
- (15) Captain Hazelwood was never told that he could not drink
- (16) again nor did he ever believe he could not drink again
- (17) Plaintiffs say after he came out of rehab that he drank here,
- (18) he drank there, and it goes on and on and on and on It
- (19) doesn't go on and on and on The evidence in this case is that
- (20) there were 13, 13 to 15 occasions where he had a beer - two
- (21) glasses of wine, he had two vodkas in Portland that's true,
- (22) and the same night he had wine So that's really one day, one
- (23) occasion
- (24) He had three beers in Portland watching a hockey game in
- (25) his apartment with his friend Kimtis

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- (1) He had three vodkas on the night of the - on the afternoon
- (2) of the grounding and he had one incident in 1988 where his
- (3) buddy Kimtis - same age, good friends family friends -
- (4) passed away suddenly He was bereaving then so he drank
- eight
- (5) drinks
- (6) But he had 13 to 15 incidents in four years Do you know
- (7) how many days there are in four years? I figured this out 14
- (8) hundred and 60 days
- (9) You know what this means? It means that he drank one time
- (10) every 100 days That's three and a third months One time
- (11) every three and a third months One beer two glasses of
- (12) wine
- (13) Ladies and gentlemen, if that isn't modest social drinking
- (14) at its best I got to tell you, we're all alcoholics That's
- (15) modest social drinking and that's exactly what he was doing
- (16) There's no evidence here that when Captain Hazelwood had
- (17) one beer he had to have four beers or ten beers or 20 beers
- (18) and he drank until he passed out There's no evidence like
- (19) that because it didn't happen Captain Hazelwood was not a
- (20) recovering alcoholic
- (21) Folks, it's all nonsense You've seen Captain Hazelwood
- (22) You heard him testify on the stand You've observed him
- (23) You've observed him here for a month He's a good, decent
- (24) responsible man who's being unfairly trashed and un- - and
- (25) unjustifiably deprived of his dignity by plaintiffs' counsel

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- (1) For what? For what? So they can come in here and bolster
- (2) their case so they can give you a better argument They
- (3) should be ashamed of themselves and you shouldn't buy into it
- (4) I want to talk about impairment I want to put up a
- (5) chart Ladies and gentlemen, these are 20 witnesses who saw
- (6) Captain Hazelwood on the afternoon of March 23rd, the
- (7) evening
- (8) of March 23rd, the early morning hours of March 24th and the
- (9) late morning hours of March 24th 20 witnesses - some Exxon
- (10) employees, but a lot of people who are not Exxon employees
- (11) There isn't a single witness in these 20 who said Captain
- (12) Hazelwood was impaired not a single witness
- (13) Who said he was impaired? Nobody Nobody came into this
- (14) courtroom and said they saw Captain Hazelwood on the 23rd or
- (15) 24th and found him to be impaired The only one that says he's
- (16) impaired is Mr O Neill and he didn't see him
- (17) I want to talk about some of these witnesses, because
- (18) they're interesting 16 and 17, Delozier and Falkenstein, they
- (19) were the on-scene Coast Guard investigators who boarded the
- (20) vessel at 3 45 a m on the morning of the 24th Now, you
- (21) remember Falkenstein he said that Delozier told him that he
- (22) smelled alcohol on the captain's breath and he concurred But
- (23) he also said that based on what he saw, he wouldn't have never
- (24) ordered the blood test to be taken because he didn't see any
- (25) signs at all of impairment and so did Delozier
- (26) Why is that significant? When these guys came on they

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- (1) believed the ship was in a perilous state They didn't know
- (2) what was going to happen They didn't know if the ship was
- (3) going to break up they didn't know if it was going to
- (4) capsizе They were scared witless okay and they were acutely
- (5) aware of the impairment issue Why? Because they smelled
- (6) alcohol on his breath so they had to be looking for signs of
- (7) impairment Their lives depended on it, the lives of the crew
- (8) depended on it
- (9) So what do they say? They said Well, other than this
- (10) perceived smell of alcohol - which could have been the
- (11) nonalcoholic beer Moussy - we didn't see any signs of
- (12) impairment They had the right, if they felt that Captain
- (13) Hazelwood was impaired to remove him from command They
- (14) not
- (15) only had the right but if they felt he was impaired it was
- (16) their lives Did they remove him? No, they didn't remove him
- (17) at all They said he was fine He looked fine, he acted fine
- (18) he was in control he was - he was in charge of the
- (19) situation
- (20) Are these guys Exxon witnesses that came in here and lied?
- (21) Of course they're not The other guy that's interesting is
- (22) this guy here, Kunkel He was the chief mate If you
- (23) remember, he came up to the bridge about 12 30 and he said
- (24) just like Chicken Little almost he thought the world had come
- (25) to an end He wasn't going to see his wife again this was his
- (26) last day on earth You remember that?

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- (1) And he said, I talked to the captain and I looked him right
- (2) in the eye, I looked him right in the eye and the captain
- (3) started giving me orders and they were so precise so
- (4) competent that my fear dissipated You think if Captain
- (5) Hazelwood was impaired as Mr O Neill suggests that he would
- (6) have had that kind of effect on a guy that was already starting
- (7) to panic? No way
- (8) The third guy that's interesting here is the pilot William
- (9) Murphy Captain Murphy - he's not an Exxon employee - said
- (10) that he interacted with the captain in the afternoon, they had
- (11) lunch together, then he interacted with him when he came on
- (12) board that evening and he was with him for a couple hours
- (13) before he left He said, I smelled what I thought was
- (14) alcohol, but he wasn't impaired He said Captain Hazelwood
- (15) wasn't impaired He acted professionally he acted like he
- (16) always acted, in charge, in command
- (17) Now, I want to show you something, because this is
- (18) important for later on Can I have the trip tickets?
- (19) Okay, this is the pilot tickets Let me start with the
- (20) 22nd, this is Captain Hazelwood's signature
- (21) Here's his signature on the 23rd This is the - the
- (22) evening that Pilot Murphy got off - they're exactly the same,
- (23) ladies and gentlemen If this man was impaired you think he'd
- (24) be able to sign the way he did right on the line straight as
- (25) an arrow? No way

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- (1) Another thing that's important here is Mr O Neill showed
- (2) you a picture of a vial of blood, told you there's all kind of
- (3) initials and stuff on there He didn't tell you they were
- (4) Captain Hazelwood's initials They weren't and I'm going to
- (5) get to the blood test because Mr O Neill gave you the
- (6) quick-over on that one
- (7) So what is - what is the so-called evidence that the
- (8) plaintiffs have that Captain Hazelwood was impaired? It's the
- (9) blood alcohol test result of 061 They say that comes from
- (10) Captain Hazelwood's blood sample that was taken from him the
- (11) morning of the grounding
- (12) You remember in my opening statement, I promised you a
- (13) story of incredible bungling or purposeful tampering? You
- (14) remember that? Everything I told you about the blood test
- (15) came
- (16) to be Every piece of evidence that I told you would be
- (17) presented was presented
- (18) This blood test, ladies and gentlemen, was completely
- (19) botched There's a serious question as to whether it's even
- (20) Captain Hazelwood's blood Judge Holland is going to instruct
- (21) you about - can I have Judge Holland's instruction?
- (22) He's going to instruct you, first of all, that the
- (23) plaintiffs must prove by a preponderance of the evidence that
- (24) the test was reliable and that the samples remained unchanged
- (25) at all times You're the sole judges of that The chain of
- (26) custody regulations that we're talking about are intended to

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- (1) protect the integrity of the samples, to prevent tampering and
- (2) to ensure what is tested is what is removed from the subject
- (3) They're also intended to preserve and prevent the blood from
- (4) self-generating or becoming contaminated and giving a false
- (5) positive reading
- (6) Now, Judge Holland is going to give you this instruction and
- (7) he is going to say to you if you find that the chain of custody
- (8) was breached in any way, you can disregard that test. That is
- (9) what this instruction is about. If you find that these federal
- (10) regulations were not complied with, you may completely
- (11) disregard the blood test or you may give it as much weight as
- (12) you think it deserves. These are federal regulations, ladies
- (13) and gentlemen. Every single one of these regulations was
- (14) violated. Every single one when it comes to Captain
- (15) Hazelwood's blood.
- (16) Let us go quickly about what happened. I don't want to
- (17) belabor the point.
- (18) Mr. Conner said he took blood from Captain Hazelwood, and
- (19) what's important here is he said he put an orange tag, you
- (20) remember - an orange tape up the side, across the top and
- (21) down
- (22) the side and then he crimped it. He didn't put any white
- (23) stuff on it. He put an orange tape, that is what he said. He
- (24) put it in a Styrofoam box, sealed it and went ashore.
- (25) Now, instead of putting it into a locked refrigerator as
- (26) he should have done - that's what the regulations call for.

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- (1) he took it and put it on the window sill, told you that
- (2) That's a violation.
- (3) He then took it - instead of again putting it into a
- (4) locked refrigerator - put it in the general galley, next to
- (5) the tomatoes and the lettuce, you remember that left it there
- (6) unattended overnight. Accessible to any number of people.
- (7) That's a violation.
- (8) He then took it on his lap, got on a plane, went to
- (9) Anchorage and instead of taking it to Lieutenant Stock, who
- (10) was his commanding officer, he took it home and put it in his
- (11) refrigerator. That's a violation.
- (12) Stock, who didn't know anything about handling of
- (13) samples - you remember that? Stock said he had to call
- (14) somebody in the DA's office or trooper's office because he
- (15) didn't know what to do, breaks the seals and takes the samples
- (16) out and starts looking at them.
- (17) That's an incredible violation. That is what the chain of
- (18) custody is all about. You don't break the seals and start
- (19) looking at the samples, they're not supposed to be handled.
- (20) That was an incredible violation, I'm telling you.
- (21) He then takes them and sends them to some unattended
- (22) remote
- (23) warehouse here in Anchorage. That's a violation. Then he puts
- (24) them in a Federal Express envelope and - unrefrigerated and
- (25) sends them to CompuChem down in Sacramento. That's a
- (26) major
- (27) violation.

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- (1) So what happens? CompuChem gets the samples. Karen
- (2) Metcalf, she testified, was told by Dr. Peat, Be very careful
- (3) this is a very important case, this was the grounding of the Exxon
- (4) Valdez, make sure that you log these things in right.
- (5) And she did, she logged them in. And she said she didn't
- (6) make any mistakes and you know what, she didn't make any
- (7) mistakes at all because everybody else is she got right. What
- (8) the plaintiffs are suggesting is that she got Hazelwood's
- (9) wrong.
- (10) She didn't get Hazelwood's wrong, she got it right. She
- (11) got three ten milliliter red stoppered tubes of blood. That is
- (12) what she got when they first came in.
- (13) Why is that significant? Red-stoppered tubes do not
- (14) contain preventatives and they're not used for blood alcohol
- (15) testing. You got to have the gray stoppered tubes, that is what
- (16) Conner said he used. But that is not what she said she
- (17) received. Conner knows the significance, but that is what she
- (18) got.
- (19) So what happens? The evidence is that, when you put it in
- (20) red stoppered tubes, the blood can ferment, it can become
- (21) contaminated, then you're going to get a false positive
- (22) reading.
- (23) That is what happened here. That is exactly what happened.
- (24) You hear Cousins' blood was contaminated. That is because it
- (25) wasn't refrigerated. That is what was happening. You also

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- (1) heard that Captain Hazelwood's blood underwent this process
- (2) of
- (3) hemolysis, you remember that red blood cells burst? Well,
- (4) their expert, Dr. Smith, said when that happens, the test
- (5) result is unreliable.
- (6) I mean, just for those reasons alone, you can disregard the
- (7) test, but throw in this violation of the chain of custody and
- (8) this test should be completely disregarded by you.
- (9) But you know what? I want to talk about this, because it is
- (10) interesting. The fiasco didn't end there. You remember?
- (11) Mrs. Peat, Dr. Peat's wife, without explanation - but there
- (12) really is an explanation - on May 1st, can we see - on May
- (13) 1st she hadn't been involved in these samples at all up to that
- (14) point. She went in, took the samples out, went over - by the
- (15) way, look at all the people that handled the samples before
- (16) that and not one of them ever noticed any problems because
- (17) there were no problems, but here she comes, right here, she
- (18) takes them out of storage and goes over to Ms. Metcalf and she
- (19) says, You've made a mistake, change the records. And that is
- (20) when she changed it to this, to conform with what Conner said.
- (21) Now Ms. Metcalf wasn't shown the samples. She was shown a
- (22) tube, real quick and said, This is where you made a mistake, go
- (23) ahead and change the records. Ms. Metcalf said I didn't make
- (24) a mistake, but she told me I did so, she's my boss, I had to
- (25) listen to her.
- (26) You remember what Dr. Peat said. He had gotten a call, he

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- (1) kind of tried to fudge it but he had to admit he got a call
- (2) from the NTSB before this date and they told him that his
- (3) records didn't conform with what Conner was saying so that s
- (4) why they changed it
- (5) But you know you remember the letter of May 1st that the
- (6) NTSB sent to Peat? He said to him We don't think there s
- (7) anything wrong, but do us a favor will you send a
- (8) gray-stoppered tube to another lab so we can confirm that your
- (9) readings of Captain Hazelwood s blood is correct
- (10) Did he do that? No
- (11) You know why he didn't do that? Because there was no
- (12) gray-stoppered tubes
- (13) What he did was - he was very sneaky, this guy He took a
- (14) sample of the same tube that he had tested remember that?
- (15) Sample of the same tube and he sent it on to another
- (16) laboratory What kind of confirmation is that? They re
- (17) testing the same thing Confirmation means you send another
- (18) tube so they can look at the other tube and see if they get the
- (19) same reading He didn't do that because you know why he
- (20) knew
- (21) he wasn't going to get the same reading
- (22) What s really interesting in this whole thing though is
- (23) the government s involvement
- (24) You remember Conner testified that he was hauled into
- (25) Cleveland into an FBI office and he was leaned on by a guy
- (26) named Lensin from the DLJ and he was intimidated He told
- (27) you

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- (1) he was intimidated
- (2) Then the NTSB gets involved and they change the records
- (3) Then a year and a half later in July Lensin is back again and
- (4) that s when they get you remember Metcalf to write an
- (5) affidavit So my question If everything s so great about
- (6) this chain of custody why is the government going through all
- (7) this trouble to change the records? You know why? Because it
- (8) isn't great This chain of custodies was all fouled up from
- (9) day one
- (10) Now who says who says that the chain of custody was
- (11) wonderful? Dr Smith You remember Dr Smith Dr Smith
- (12) said I didn't speak to Mr Conner, I didn't speak to
- (13) Lieutenant Stock I didn't speak to Ms Metcalf I didn't speak
- (14) to Mrs Peat I didn't speak to Dr Peat before I came to my
- (15) opinion I did speak to Dr Peat two weeks before I came here
- (16) to testify and he said everything was okay
- (17) Well everything wasn't okay I mean, if that s what he's
- (18) going to base it on then what I have to ask is I wonder how
- (19) Dr Smith would feel if this was his blood and he was sitting
- (20) in that defendant s chair, would he think it s wonderful? You
- (21) can rest assured he wouldn't
- (22) Let me see that picture we have a picture of the blood -
- (23) okay, let s put it up
- (24) Now, ladies and gentlemen this is a picture like
- (25) Mr O'Neill s picture that was taken a year and a half after

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- (1) the fact by Dr Peat Remember the samples were sent out
- (2) East? And that s when he took the picture
- (3) Mr Conner said he put this orange tape over the top
- (4) That s all he said he did Ms Metcalf and Lieutenant Stock
- (5) said there was a thin white seal over the top There was
- (6) nothing else on it, just a thin white seal and a red evidence
- (7) tape around that - like this okay?
- (8) Does this look - does any of this look like anything these
- (9) people described? Does it look like that? Where did this
- (10) white thing come from? That s not a thin white seal Where is
- (11) Conner's orange tape that was by itself?
- (12) Ladies and gentlemen these samples were doctored They
- (13) were doctored and somebody writing Joe Hazelwood s name
- (14) on
- (15) there and saying this is Joe Hazelwood s samples is nonsense
- (16) Joe Hazelwood didn't sign those samples those weren't his
- (17) samples It s that clear
- (18) I want to talk about the events of the afternoon and
- (19) evening of March 23rd Mr O'Neill says that Captain
- (20) Hazelwood
- (21) had six to 16 drinks He has no proof of that The proof is
- (22) Captain Hazelwood said, I had three vodkas That s confirmed
- (23) by his crew mates Question is, did he have a fourth He says
- (24) he didn't His crew members say I don't know we ordered the
- (25) drink I don't know if he started it drank some of it or
- (26) finished the whole thing That s the evidence Okay?
- (27) Now, Mr O'Neill says oh but wait a minute how about

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- (1) Lisa Harrison? Let me tell you what Lisa Harrison says She
- (2) says that he came in alone between 11 30 and 12 He ordered
- (3) a
- (4) double vodka, he stayed 20 to 30 minutes was wearing a white
- (5) or gray sailor s hat Then she says the same man came back at
- (6) two p m and ordered another double vodka and he stayed for
- (7) 15
- (8) to 20 minutes and left
- (9) The other - the bar patron Janice Delozier says - by
- (10) the way, she's the wife of the investigating officer, I told
- (11) you that - that he came in at 1 40 - sorry 1 45 with two
- (12) other men and he was wearing a golf hat with a snap in front
- (13) Said he was five foot-nine Captain Hazelwood is not five
- (14) foot-nine
- (15) That he was 50 to 55 That's an insult That he had olive
- (16) skin - sorry Judge, I mean as far as Captain Hazelwood is
- (17) concerned
- (18) And that he had a beard only up here to his chin Well
- (19) that s not Captain Hazelwood
- (20) She says that he drank two single vodkas and he was there
- (21) when she left at 2 45 Okay, no one has said that they saw
- (22) Captain Hazelwood in the Pipeline Club from 2 00 till 4 00 as
- (23) Mr O'Neill suggests That s the evidence that Harrison and
- (24) Delozier talk about
- (25) Now, Erma Lee, she was the bartender later on She said
- (26) that the man she identifies as Hazelwood came in at 7 00 had
- (27) one drink, stayed 15 to 20 minutes and left - he was alone

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(1) left Her description of Hazelwood is yet different than the
 (2) other two
 (3) Ladies and gentlemen, what you have here is three ladies
 (4) who are friends who hang around a bar together who got to
 (5) talking It s a small town and they all wanted to be part of
 (6) the action That s all it is to it None of these ladies saw
 (7) Captain Hazelwood that day
 (8) What really happened? You heard the evidence Captain
 (9) Hazelwood and his two crew members, along with Pilot Bradley
 (10) got into a car and left the Alyeska Terminal at 10 59 They
 (11) went directly to the Alamar office and got there about 11 30
 (12) They stayed at the Alamar office altogether for an hour from
 (13) 11 30 to 12 30 Nobody left They were all within each
 (14) other s sight
 (15) At 12 30 they were picked up by Pilot Murphy and driven
 (16) over to the Pizza Palace where they had lunch from 12 30 to
 (17) almost 2 00 You heard testimony on that They stayed
 (18) together the whole time Captain Hazelwood didn't drink then
 (19) They were driven by Mr Murphy, Captain Murphy over to the
 (20) Hobby Hut just before two Mr Roberson and Captain
 Hazelwood
 (21) went into the Hobby Hut and, in the Hobby Hut Captain
 (22) Hazelwood ordered flowers for his wife
 (23) Now we showed you - do we have that?
 (24) We showed you the telephone records where his charge was
 (25) verified at 2 02 Do you remember that? Can you zoom it in?

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(1) I trained him
 (2) At 2 02 That s what that says And Mrs Kaiser said that
 (3) he stayed in her shop from 2 00 for 45 minutes to an hour
 (4) That s what she said
 (5) Mrs Kaiser doesn t work for Exxon Why would Mrs Kaiser
 (6) lie? She doesn t know Joe Hazelwood, but she knew she saw
 him
 (7) that day, he bought flowers from her he was standing right
 (8) next to her She said he was cold-stone sober, didn't smell
 (9) any alcohol on him
 (10) So if Captain Hazelwood is with Captain Murphy until two
 (11) and is in the flower shop from two to almost 3 00 he couldn t
 (12) be in the Pipeline Club, and if he s at the Alamar office from
 (13) 11 30 to 12 30, he couldn t be in the Pipeline Club when Ms
 (14) Harrison said she saw him
 (15) Now Captain Hazelwood has told you that he left the Hobby
 (16) Hut and walked around town for about an hour hour and a half
 (17) he went into some other shops then he went back to the Alamar
 (18) office and he arrived at the Pipeline Club at 4 30 That proof
 (19) is uncontroverted Uncontroverted That s when he got there
 (20) And he told you, while he was there, he had three single
 (21) vodkas So Mr O Neill comes in with these innuendos and
 (22) suggestions well the glass was this and the barmaid might
 (23) have poured doubles and blah blah blah-blah-blah The
 evidence
 (24) says he had three single vodkas and he didn t have three
 (25) single vodkas like this (indicating)

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(1) They sat there for two and a half hours and they were just
 (2) talking as friends do drinking socially And they stayed
 (3) together the whole time As soon as Roberson got there little
 (4) bit before five, they were together the whole time They left
 (5) the Pipeline Club together and they walked - you remember,
 (6) they were going to go back to the ship at that point but
 (7) Mr Glowacki said, Wait a minute I got to get pizza for the
 (8) crew
 (9) So they went to the Pizza Palace They had no intention of
 (10) going to another bar at that point they were going to go
 (11) home If you remember - I want you to keep this in mind -
 (12) when they were leaving the Pipeline Club about seven o'clock
 (13) they believed that the ship was going to sail at 10 00 That s
 (14) what they believed, or later That s the testimony
 (15) When they got over to the Pizza Palace it was crowded, and
 (16) instead of standing out where it was raining and snowing, they
 (17) ducked into the Club Valdez next door Captain Hazelwood
 has
 (18) told you they ordered a drink because they didn't want to just
 (19) stand there in the guy s bar, but he didn t drink it The
 (20) other two guys say they don t know if he did or not That's
 (21) the evidence that we have on that
 (22) Then they came out, got into a cab, went back to the
 (23) Pipeline Club to pick up a fourth passenger They didn't get
 (24) out of that taxi Ms Lee couldn t have seen them there when
 (25) she said she saw them They didn t get out of the taxi and

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(1) went directly to the Alyeska gate
 (2) Now Mr O'Neill says that Captain Hazelwood violated the
 (3) four hour rule That's true There s a technical violation of
 (4) that four hour rule because the ship sailed an hour earlier
 (5) than they expected, at least an hour earlier However, the
 (6) judge is going to instruct you that you can ignore that
 (7) technical violation if you find that he was not impaired, and
 (8) that that violation was not a proximate cause or a legal cause
 (9) of the grounding, you can ignore that violation
 (10) Okay They come back to the Alyeska gate about 8 24
 (11) Mr O Neill told you in his opening statement that Captain
 (12) Hazelwood was impaired Certainly if you believe his 16-drink
 (13) count he wouldn't have been impaired he would have been
 (14) dead
 (15) But anyway, he said he was impaired Well, Michael Craig
 (16) he doesn t work for Exxon He came in here, he's the gate
 (17) guard He says their job is to make sure - what are you
 (18) doing - yeah, is to make sure - he's taking over [sic] Is to
 (19) make sure that these people are not impaired when they come
 (20) on That's what they re looking for, signs of impairment
 (21) If you believe Smith s - Dr Smith s account at the time
 (22) that he came back to the vessel - and this is - Smith had the
 (23) lower average rate, you see this, zero one five, he would have
 (24) been a 271 he would have been nausea and vomiting
 (25) diplopia - that's double vision, I looked it up Marked

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- (1) ataxia which is marked stumbling falling down - and that s
 (2) using the lower numbers
 (3) If you use Dr Mendelson s numbers - which Dr Mendelson
 (4) did this, assuming that - that he's an alcoholic as plaintiff
 (5) suggests, okay, at nine clock he would have been at 481
 (6) 9 00
 (7) 481 look at that coma death I mean, I don t know what
 (8) Mr Craig was thinking about but he had a dead guy that he
 (9) said wasn't impaired
 (10) It s nonsense It s all nonsense
 (11) Okay, you heard that when he came through the gate, he did
 (12) that long walk down the jetty, up the steep gangway - was
 (13) snowing, down the steep gangway Did it with one hand No
 (14) problem Seen by some crew members, fine, he looked fine
 (15) He
 (16) wasn't impaired Where is that one witness that said he was
 (17) impaired? There is no such witness You got 20 eyewitnesses
 (18) who came in and said he wasn't impaired The man was not
 (19) impaired
 (20) I want to talk about Captain Hazelwood s actions during the
 (21) voyage Plaintiffs' theory on this is that Captain Hazelwood
 (22) was so impaired that he was doing screwy things, that his
 (23) actions during the voyage really show someone who was under
 (24) an
 (25) impaired state
 (26) First of all, they don t have any witnesses that say that
 (27) There s not one single eyewitness that says he was impaired

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- (1) but that s their theory Remember and what s they rely on
 (2) then is Captain Clark
 (3) You remember Captain Clark? He s the guy that came in here
 (4) after five years and in the comfort of this courtroom and said
 (5) that Captain Hazelwood's actions before the grounding
 (6) exhibited
 (7) poor judgment But you remember Captain Clark don t you?
 (8) He
 (9) was the guy who had his opinion written by one of plaintiffs
 (10) lawyers remember? It got sent to him and he retyped it and
 (11) sent it back That s the guy He s also the guy in 20 years
 (12) at sea never ever made a mistake How about that 20 years
 (13) never made a mistake never came close to an accident He s
 (14) the guy that s passing judgment on Captain Hazelwood
 (15) Now he made a big deal about Captain Hazelwood being off
 (16) the bridge in the Narrows, but on cross-examination, he - you
 (17) know he told you about the tugs and the one way zone and the
 (18) six miles per hour and there s no regulations requiring the
 (19) captain to be on the bridge He said, you re right the
 (20) transit was uneventful and it played no role in the grounding
 (21) That s the bottom line
 (22) Then he had criticism of Captain Hazelwood s communications
 (23) with the VTC He said well he should have reported that
 (24) course change of 180 He didn t do that
 (25) I put up a chart for you you remember throughout these
 (26) proceedings, where I compared what the Arco Juneau did and
 (27) the
 (28) Brooklyn did and what they reported and what Captain
 (29) Hazelwood

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- (1) reported Captain Hazelwood gave a heck of a lot more
 (2) information than the other two guys He was giving speed and
 (3) courses in full compliance with the regulation Not only that
 (4) but he told the VTC, I m leaving the lanes I m leaving the
 (5) TSS They understood that They testified they understood
 (6) that They knew exactly what he was doing
 (7) Now Mr O'Neill says the Arco Juneau and the Brooklyn
 (8) didn t go on Bligh Reef because their captains were on the
 (9) bridge Where's the evidence? There s no evidence on that
 (10) We don t know who was on the bridge and who wasn t
 (11) Now they then say, Well he should have used the
 (12) autopilot You remember the autopilot That was on for about
 (13) five to eight minutes, and Captain Hazelwood explained to you
 (14) that the reason he put on that autopilot was so he could get a
 (15) clear picture of the ice He was standing over the radar
 (16) looking at the ice He wanted a clear picture so he wanted a
 (17) steady course That's what he wanted a steady course and he
 (18) didn t want to have to watch the helmsman because they were
 (19) changing watch at that moment Perfectly logical reason for
 (20) putting the autopilot on
 (21) Captain Bolton said yes that was an excellent reason for
 (22) doing it And you know what there are no regulations that
 (23) prohibit the use of the autopilot Both Clark and Bolton used
 (24) it often they said in Prince William Sound There's nothing
 (25) wrong with that

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- (1) And they both agree, the autopilot played no role in the
 (2) grounding
 (3) I want to jump ahead for a second to after the grounding
 (4) Mr O'Neill through these proceedings played for you Captain
 (5) Hazelwood's call to the VTC, you remember that? And he said
 (6) Oh look this guy sounds drunk Well ladies and gentlemen
 (7) this man just had a major calamity He was in shock He was
 (8) under tremendous stress, he was on the verge of tears That s
 (9) what comes through, not that he was drunk
 (10) At 1 07 he calls back You heard his voice perfectly
 (11) fine I wonder how we would feel if we were on the bridge that
 (12) night and that happened? I tell you what, I would be crying
 (13) Now after the grounding what the plaintiffs say is that
 (14) Captain Hazelwood tried to get the vessel off the reef and what
 (15) they base that on is his call to the Coast Guard at 1 07 He
 (16) spoke to Commander McCall, but you heard all the experts that
 (17) came in here, including Julius Herman Leitz
 (18) You remember Julius? He said No, no, all the actions, all
 (19) the maneuvers that he made were intended to keep that vessel
 (20) on
 (21) the reef They were intended to ascertain where he was in
 (22) relation to the reef and that's what he was trying to do
 (23) That s what Captain Hazelwood told you he was doing
 (24) That s what Kunkel said he was doing and that s what he did
 (25) He never used anything more than 26 percent of the power
 (26) available to him All he had to do was press a button if he

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- (1) wanted he would have gotten full ahead or full astern
 (2) Never put the engines in reverse, never used any more than
 (3) five to ten degrees of rudder He was ascertaining Those are
 (4) the actions of a man who knows what he's doing, not a
 (5) incompetent mariner, not somebody who's impaired as the
 (6) plaintiffs suggest They said, Wait a minute, if he's doing
 (7) all this why is he telling the Coast Guard something else?
 (8) Well he's telling the Coast Guard Mr Leitz told you
 (9) because at this point, he's in shock he's traumatized These
 (10) are wishful thoughts of a mariner who wants to be anywhere
 else
 (11) than Bligh Reef That's what he's telling the Coast Guard, and
 (12) you know what, Commander McCall, the guy who heard this
 the
 (13) call was made to Commander McCall, said I didn't think he was
 (14) trying to get off the reef What I understood him to be doing
 (15) was ascertaining his position to see if he was merely aground
 (16) or hard aground, and, you know what, if I were in that
 (17) position, he said, I would want the engines on, I'd want to
 (18) have my hand on the stick That's precisely what Captain
 (19) Hazelwood did
 (20) Mr Leitz told you - plaintiffs suggest that by using the
 (21) rudder and the engine that he might have caused some
 additional
 (22) damage You heard there was no additional damage as a result
 (23) of that
 (24) The only relevant period that we're talking about here,
 (25) ladies and gentlemen, in respect to Captain Hazelwood's
 actions

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- (1) starts at the moment that he's standing over the radar with
 (2) Mr Cousins and they're looking at the ice They're
 (3) ascertaining They're thinking about the maneuver they're
 (4) going to make and they're both there, and Captain Hazelwood
 (5) isn't there dictating to Cousins, he's asking Cousins for input
 (6) and Cousins is giving him input and they're talking about it
 (7) At some point Captain Hazelwood says, Greg look I need to
 go
 (8) down below do you think you can handle it? He says Yes
 (9) Captain I'm comfortable with the situation Not once but
 (10) twice
 (11) You heard the testimony on this It's clear visibility,
 (12) eight to ten miles they could see Busby Island light they
 (13) could see the buoy Captain Hazelwood - could I see my ice
 (14) chart here? This is Exhibit 1729
 (15) Captain Hazelwood said that when he was standing at the
 (16) radar with Cousins he saw the ice as such Cousins says he
 (17) saw it as such That's exactly the same, there is very little
 (18) difference Either way they've got more than two miles to the
 (19) buoy Captain Hazelwood brings the vessel and puts it right
 (20) dead center in the fairway If I could hit a golf shot like
 (21) that I'd be on the tour Right in the middle of the fairway
 (22) And all he wants Cousins to do is a simple maneuver Tells
 (23) him When you get abeam and he's got it on 180 All Cousins
 (24) has to do is look out the window, look out the door That's
 (25) all he has to do, when the light comes into view start his

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- (1) turn That's all he had to do He had them lined up perfect
 (2) to come down the middle of the fairway
 (3) Mr O'Neill says Well, he left two minutes before the
 (4) turn He should have stayed on the turn - should have stayed
 (5) on the bridge Ladies and gentlemen, when Captain
 Hazelwood
 (6) left that bridge in his mind his job was done He had that
 (7) ship lined up All Cousins had to do was make a simple
 (8) maneuver, well within his capabilities Captain Hazelwood was
 (9) on to the next task, which was figuring out the weather
 (10) Mr O'Neill suggests that this is a concocted story It's
 (11) not a concocted story That's been Captain Hazelwood's story
 (12) from day one He was looking at a low pressure that was
 (13) developing in the Aleutians He wanted to know - he had slack
 (14) tanks he told you, where the tanks weren't filled out He was
 (15) concerned you're going to get a beating out there You're
 (16) going to get 40 to 50 foot seas sometimes because of these
 (17) things He's concerned, he's trying to figure it out
 (18) Did he make that up? You heard what Mr Leitz said Two
 (19) days later, the storm came through Prince William Sound with
 70
 (20) mile an hour winds Where did that storm come from, heaven?
 (21) Well I guess it did initially, but it came up through the
 (22) Aleutians That's what he's looking at That's not a made up
 (23) story
 (24) Captain Hazelwood at this point in time - I mean, he's too
 (25) good of a sailor to walk off two minutes if he has any doubts

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- (1) He knows the thing is set up All Cousins has to do is make a
 (2) simple maneuver, well within his capabilities
 (3) Now one of the things that Captain Hazelwood - that's
 (4) been brought out is that Captain Hazelwood had pilotage You
 (5) remember the testimony on that And Captain Holland, should
 (6) say Admiral Holland - the Judge will instruct you that there
 (7) was a regulation in place but that regulation could be varied
 (8) and changed by the Coast Guard in this case, the captain of
 (9) the port And that regulation was in fact changed because not
 (10) only Captain Hazelwood but Captain Bolton Captain Mihajlovic
 (11) and Captain Clark, their expert said when they read that Alamar
 (12) letter of September 19, 1986, they believed that pilotage had
 (13) been waived That's the - that's the assumption and
 (14) perception that Captain Hazelwood was operating Pilotage
 was
 (15) not needed below Rocky Point as of September 16th - 19th,
 (16) 1986 If you find that that regulation was varied, you can
 (17) ignore that, that particular federal statutes
 (18) I want to talk a little bit about the Coast Guard here
 (19) The VTC system was set up there to prevent collisions and
 (20) groundings Their only job is to keep an eye on these ships on
 (21) radar all the way down to Bligh Reef This ship was well
 (22) within radar range Matter of fact when Captain Hazelwood
 (23) called in and said, I'm aground Blandford switched it to 12
 (24) miles and there it was bright as day He should have been
 (25) watching that ship should have been watching that ship, and

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- (1) his job was to warn them if they stood into danger Captain
 (2) Hazelwood knew that when he left the bridge that he would get
 (3) a warning if the VTC was doing their job
 (4) Unfortunately, they weren't doing their job so when they
 (5) say, Well this grounding might not have happened if Captain
 (6) Hazelwood was on the bridge, well, it might not have happened
 (7) if the VTC was doing their job, too
 (8) We can all speculate and the fact that any number of
 (9) captains will come in now and say, Well if I was in a similar
 (10) circumstance I would have stayed on the bridge Well, of
 (11) course that's what they're going to say five years after the
 (12) fact - what are you going to say when you know there's been a
 (13) grounding Oh no I would have done the same thing? Of
 (14) course
 (15) you're not going to say that Captain Hazelwood told you that
 (16) if he knew then what he knows now he would have never left
 (17) the
 (18) bridge
 (19) Captain Hazelwood, when he left the bridge, was ten seconds
 (20) away If he believed at any time that Mr Cousins was
 (21) uncomfortable wasn't going to carry out his orders, he would
 (22) have been up on the bridge immediately But what happened?
 (23) He
 (24) got a call from Mr Cousins and as he instructed him to do, he
 (25) told him call me as soon as you start your turn Called him
 (26) And said to Mr Cousins What rudder are you using? Said ten
 (27) degrees That's fine any problem with the ice? Said Well
 (28) we might get into the leading edge

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- (1) By the way, keep in mind what the ice is It's not a
 (2) sheet it's pieces of ice You saw the Dan lawn video That's
 (3) what the ice looks like
 (4) Said We might get into a couple of pieces in the leading
 (5) edge Captain Hazelwood said Is that going to present a
 (6) problem? And he said No it's not going to present a
 (7) problem
 (8) He was calm when he was saying this he didn't indicate any
 (9) discomfort at all He didn't indicate anything was amiss
 (10) because if he had Captain Hazelwood would have been back
 (11) up
 (12) on the bridge He lulled him into a false sense of security
 (13) and Captain Bolton told you that's probably as big a cause for
 (14) this grounding as anything else that happened
 (15) Now I want to talk very quickly about the concepts of
 (16) recklessness
 (17) How am I doing?
 (18) THE COURT About six minutes
 (19) MR CHALOS Okay Judge Holland will instruct you on
 (20) what recklessness is You should listen to his instruction
 (21) But I want to put it into the context of this grounding If
 (22) Captain Hazelwood walked off the bridge as the plaintiffs
 (23) suggest with the ship headed right for Bligh Reef with the
 (24) pedal to the metal as they say, knowing that this thing was
 (25) going to run aground and there's nothing Cousins could do
 (26) about
 (27) it he would have been reckless If he walked off the bridge

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- (1) with Mr Cousins hanging onto his leg saying Please Captain
 (2) don't leave, I don't know what I'm doing here he would have
 (3) been reckless If he left the bridge and said I don't care
 (4) what happens, don't bother me, he would have been reckless
 (5) But you don't have anything that approaches even a little
 (6) bit of that nothing He talked to Mr Cousins, they had a
 (7) plan together He had the ship lined up perfectly they had
 (8) two miles they had a big window to shoot through He was ten
 (9) seconds away He told Cousins to call him When Cousins
 (10) called him, he questioned him closely Are those the actions
 (11) of a reckless man? No way No way was he reckless when he
 (12) left the bridge
 (13) THE COURT This is your five-minute warning
 (14) MR CHALOS Okay
 (15) Now Exxon has conceded negligence in this case Judge
 (16) Holland - and they said Captain Hazelwood leaving the bridge
 (17) was a legal cause of the grounding Judge Holland is going to
 (18) tell you that that is not binding on Captain Hazelwood You
 (19) need to judge Captain Hazelwood's actions by what he did and
 (20) what you heard in terms of what Captain Hazelwood did not by
 (21) what Exxon has conceded
 (22) Basically, our differences with Exxon revolve around which
 (23) watch condition applied They say C which required two
 (24) officers on the bridge We say A that required only one
 (25) officer I showed you - I showed you what A and C say C

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- (1) says entering and leaving port They had already left port
 (2) That watch condition didn't apply A was the right watch
 (3) condition
 (4) Now we've been - I want to say something about Captain
 (5) Hazelwood He didn't know why this accident happened He
 (6) doesn't know He wasn't up on the bridge that's true and he
 (7) doesn't know but he has not in five years that I've known him
 (8) and that you heard him ever tried to assess blame on
 (9) Mr Cousins As a matter of fact, the first call that he made
 (10) he got from his company, he says I'm taking the
 (11) responsibility it was my fault Does that mean that he's
 (12) saying I was negligent? It doesn't mean that What it means
 (13) is you've got a man of tremendous integrity and character and
 (14) responsibility that's accepting it He knew there would be
 (15) severe and painful repercussions when he took on that
 (16) responsibility He knew that I wonder how many of us faced
 (17) with a similar situation would have that kind of courage? I
 (18) bet not a whole lot of us
 (19) Now we've spent five years in litigation here trying to
 (20) figure out what happened And Mr O'Neill suggests that the
 (21) proof that we put on is a bunch of lies everybody came in here
 (22) is lying, the only people that weren't lying with are the
 (23) people that support his position Everybody else is lying
 (24) Well, he hasn't suggested that the Coast Guard lied He
 (25) hasn't said that and certainly he hasn't suggested that the

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- (1) commandant of the Coast Guard lied Let's see what he says
- (2) Coast Guard is charged with the responsibility for trying
- (3) to find out what happened They're in charge of this type of
- (4) thing Here s the commandant, Admiral Paul Yost says the
- (5) primary cause of the grounding was a perfectly qualified third
- (6) mate on the bridge of a ship that through a period of a few
- (7) minutes of inattention to duty or lack of knowledge of exactly
- (8) where he was, ran the ship aground on a clear night with all
- (9) the navigational aids watching him That s true he knew where
- (10) that light was
- (11) A person who has received a license properly issued by the
- (12) Coast Guard as a third mate on a vessel like the Exxon Valdez
- (13) should have no difficulty navigating a vessel in the area
- (14) around Bligh Reef That s what Captain Hazelwood believed
- (15) when
- (16) he left the bridge
- (17) Commander McCall - he was the man, captain of the port at
- (18) Valdez - says the biggest mistake Captain Hazelwood made
- (19) was
- (20) having too much confidence in his third mate and leaving the
- (21) bridge when he thought the third mate could steer it out of
- (22) port The allegation that Captain Hazelwood had been
- (23) drinking,
- (24) as far as being a cause of the grounding, is just smoke
- (25) Ladies and gentlemen this evidence is uncontroverted
- (26) There hasn't been one witness that came in here and said these
- (27) guys are wrong Not one witness
- (28) When you go back into the jury room to judge the actions of

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- (1) Captain Hazelwood on the night of the grounding his character
- (2) and his competency please keep in mind that the Coast Guard
- (3) who thoroughly evaluated the situation concluded that this was
- (4) an accident
- (5) This was an accident Captain Hazelwood was not negligent
- (6) and he was not reckless Captain Hazelwood as he sits here
- (7) today maintains his license as a master of any tonnage any
- (8) ocean He can go on any ship he wants, and that license was
- (9) given to him - was renewed for him by the Coast Guard who
- (10) investigated this whole thing after the grounding Keep that
- (11) in mind please And thank you very much
- (12) MR NEAL Should have had more faith Your Honor
- (13) MR CHALOS You didn t think I could finish in 50
- (14) minutes? Thank you
- (15) CLOSING ARGUMENT BY MR SANDERS
- (16) MR SANDERS Your Honor, I hope you re not counting
- (17) set up time But I ll be quick any way
- (18) May it please the Court -
- (19) THE COURT Mr Sanders
- (20) MR SANDERS - counsel Ladies and Gentlemen of the
- (21) Jury, I don t have much time and I want to get straight to it
- (22) I want to go to what I think is the key issue in this case
- (23) what actually happened This may overshadow Mr Chalos'
- (24) paramount issue It is an issue that the plaintiffs have
- (25) relegated to the very end of everything They didn t even put

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- (1) on Mr Cousin until the last two days of the case They never
- (2) called Ms Higgins We had to call her
- (3) And I sat over here and waited during Mr O Neill s closing
- (4) argument and I waited for over an hour and ten minutes before
- (5) we ever got to what actually happened then he gave you 30
- (6) seconds on it and tried to dismiss it away
- (7) One might think they re trying to avoid what actually
- (8) happened This is what happened It's 11 53 on March the
- (9) 23rd 1989 Captain Hazelwood leaves the bridge, Mr Cousins
- (10) says he tells Mr Kagan, Prepare for a course change, let s
- (11) take it off gyro
- (12) Here's what you have to do to take it off gyro, you punch
- (13) that button In about a second it s off gyro So much for
- (14) automatic pilot
- (15) Next, Mr Cousins goes, takes the time to go all the way
- (16) out on the port bridge wing and he takes a fix on the bridge
- (17) wing when he's abeam Busby Island light He does that
- (18) because
- (19) his instructions are turn when you come abeam Busby Island
- (20) light He didn t have to do that, all he had to do was look
- (21) out the window punch the button, look out the window, tell the
- (22) man to turn ten degrees But he goes out there and he does
- (23) that Comes back in, takes a range off the radar
- (24) Remember Captain Hazelwood s testimony I set him up, he's
- (25) going to be halfway between the apex of the ice and Busby
- (26) Island but he went on and took a range anyway

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- (1) What is the next thing that happens? He takes the time to
- (2) go around the corner into the chart room gets on the chart and
- (3) physically draws the fix in on the map with the time 11 55
- (4) That s why we know this time is correct He takes the time to
- (5) do that
- (6) Now, what's happening during the taking of the plot do you
- (7) remember Ms Higgins' testimony? She came in, she saw the
- (8) Bligh Reef buoy light flashing, she comes in and while he s
- (9) plotting this fix, Ms Jones comes in and says, Red light
- (10) flashing, every five seconds, broad on the starboard bow
- (11) Remember that for a minute, now, broad on the starboard
- (12) bow
- (13) This report probably took up some extra time that wasn't
- (14) necessary He already knew where the Bligh Reef buoy light
- (15) was Remember he said he d seen it on radar He didn't need
- (16) that report He knew he was outside the lanes at 11 55 because
- (17) when he plotted it he was outside the lanes Didn t need to
- (18) know that, but that report was made, probably took up some
- (19) time She goes back out on the bridge wing and she realizes
- (20) she's miscounted, the flashing of the light It s four instead
- (21) of five
- (22) Now in hindsight of course, that doesn t make any
- (23) difference at all Maybe she was trying to tell him it's time
- (24) to do something, so she goes back in and she tells him and they
- (25) both agree on this it happened at the same time, while he

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(1) is - he says When I am coming around I m getting ready to
 (2) order the ten degree right turn and Ms Jones comes in and -
 (3) Ms Jones testified - comes in and corrects her report Ms
 (4) Higgins Ms Jones, says When I went in to give him the second
 (5) report he was right beside the port radar So they re exactly
 (6) right
 (7) Now the question is what time is that What time is it?
 (8) Well we know that How do we know that? We know two ways
 (9) First we know because they're together on that Ms Higgins
 (10) Mr Cousins testimony is together This is happening at the
 (11) same time He testifies I was getting ready to give the
 (12) ten degree right order
 (13) Well we know from the physical evidence - don t have to
 (14) worry about anybody s memory don t have to worry about
 (15) anybody
 (16) lying like Mr Neal [sic] says everybody's doing Look at the
 (17) course recorder We know the turn began at ten degree right at
 (18) 12 02 right? That's the evidence uncontroverted
 (19) The machinery of the ship and Mr Cushing tells us that it
 (20) takes 30 seconds for the ship to react to a helm order so that
 (21) puts it back at 12 01 and 30 seconds
 (22) Now I asked you to remember broad on the starboard bow
 (23) What is that? Broad on the starboard bow is you look straight
 (24) ahead and you look out here, 90 degrees to your right, broad
 (25) on
 (26) the starboard bow is halfway in between those points or 45
 (27) degrees We asked Mr Cushing remember, when was the
 (28) ship,

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(1) according to the course recorder broad on the starboard bow
 (2) and he gave you the same answer that you get from the
 (3) testimony
 (4) of the people at 12 01 30 Seven minutes seven minutes past
 (5) the time the captain instructed him to make the turn
 (6) Seven minutes went by before he made the turn he was told
 (7) to make and then, second big mistake right on the heels of
 (8) that if you re here you re seven minutes late If you d made
 (9) a 20-degree turn or maybe even a 15-degree turn certainly a
 (10) hard right turn if you d made a bigger turn, everyone at
 (11) 12 02 then there would have been no tragedy And of course
 (12) the rest of what happens is almost inconsequential because, if
 (13) you do a ten-degree right at this time it s too late
 (14) Now the only piece that we have missing in this sequence
 (15) of events is when did Captain Hazelwood call Where do we
 (16) put
 (17) this? When did Mr Cousins call Captain Hazelwood? Where
 (18) do
 (19) we put this?
 (20) Mr Cousins you remember testified he did it way down
 (21) here after the turn began but Mr Cousins also testified during
 (22) his deposition that he really had a lot of problem with the
 (23) sequence and order of things and the time things took to
 (24) happen
 (25) and he wasn t sure of that Captain Hazelwood told you it was
 (26) right up here within a couple of minutes of the time that he
 (27) went below and it was within the realm of what he thought
 (28) would
 (29) be right
 (30) So I tell you the preponderance of the evidence says the

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(1) call was up here One what is going on between here and here
 (2) all this time? There has to be something in here It had to
 (3) be that If the call had been way down here you have any
 (4) doubt about Captain Hazelwood coming up? If it had been this
 (5) late and if it had been this late when he asked him is
 (6) everything all right the answer would not have been everything
 (7) was all right because it wasn t all right They were in
 (8) terrible shape by that time So that s when the turn was
 (9) made
 (10) Now one other thing you need to know The proof from the
 (11) experts proof from the track line and everything else, is that
 (12) when this right turn began, it stayed on ten-degree right from
 (13) then until the time it hit the pinnacle to the time that the
 (14) 10-degree right was ordered
 (15) In other words, it was a constant, consistent ten-degree
 (16) right turn during all this period of time
 (17) This is what happened and more particularly, this is what
 (18) did not happen In doing things that did not need to be done
 (19) Mr Cousins simply gave the order too late for the turn of
 (20) ten degrees right
 (21) But I don t want you to take my word for that Let s see
 (22) what Mr Cousins said You remember the question they asked
 (23) him What would you have done differently? And he answered
 (24) I
 (25) would never have bothered to go out and take a visual bearing
 (26) from a repeater I would not have left the three centimeter

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(1) radar I would not even have bothered to go back into the
 (2) chart room I already knew where I was I would have not left
 (3) the helmsman unattended as I did I would have taken a visual
 (4) bearing but I wouldn t have - I would not have walked out to
 (5) the repeater and sighted it It was not necessary
 (6) Why did you do it that evening? I can t answer that
 (7) Then he was asked, right after that question in a very
 (8) emotional moment, if you'll remember from the testimony You
 (9) would have stayed at the radar? Answer I would have
 (10) maintained the radar watch right there where I can do what I m
 (11) supposed to do et cetera et cetera
 (12) I am not going to read the whole thing because I don t have
 (13) the time But he told you exactly what he thought he did
 (14) wrong and finally he concluded I didn t have to, I did not
 (15) have to do what I did Or in walking out, taking visual
 (16) bearing, it was not necessary It really was not necessary
 (17) As a matter of fact, it was - considering the number of people
 (18) on the bridge, it was poor practice
 (19) This was an accident Greg Cousins was trying too hard to
 (20) do too many things that he did not need to do, and this is why
 (21) the plaintiffs have not talked about the main event in this
 (22) case The evidence in this case shows you that the legal cause
 (23) of this accident, this tragedy, was simple negligence not
 (24) reckless conduct
 (25) Now, Mr O Neill has stood up here today - and he must

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(1) have said it ten times - he asked you to choose between safe
 (2) or reckless That's a lawyer's trick He wants you to think
 (3) those are only two choices, but you know better than that
 (4) Your common sense tells you there's a long way between safe
 and
 (5) reckless and you don't have to depend on just that The
 (6) Court's going to tell you there's a long way between safe and
 (7) reckless and in between there somewhere is accident simple
 (8) negligence, human error He wants you to think the only choice
 (9) is between safe and reckless That's not what the Court is
 (10) going to tell you that's not what's involved here
 (11) Now, why do they want to do that? They want you to
 (12) concentrate on something else, ask you to go from millions
 (13) actual damages, to billions, punitive damages Mr O'Neill
 (14) asked each and every one of you that question can you go to a
 (15) billion, can you go over a billion That's the goal Money
 (16) money over and above actual damages
 (17) Now, you remember I told you that I thought this issue
 (18) might overshadow Mr Chalos issue Why is that? Well, the
 (19) evidence proves it's an accident and the proof further tells
 (20) us, teaches us if Captain Hazelwood, with all his skill and
 (21) experience, had been on the bridge that night at midnight, this
 (22) would not have happened Now, in defense of Captain
 Hazelwood
 (23) the proof shows that he could not conceive and you and I
 (24) couldn't have conceived either, I don't think, that when he
 (25) left that bridge that this very simple instruction would not

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(1) have been carried out Push a button look out the window
 (2) tell the man to turn
 (3) He couldn't conceive of that He couldn't conceive of the
 (4) fact that the Coast Guard one time wouldn't be watching to warn
 (5) if the ship was standing into danger He thought it was
 (6) reasonable He thought it was reasonable to turn from that
 (7) problem which he thought he had solved to a new one and
 more
 (8) complicated problem the brewing storm tides, how am I going
 (9) to do this what's the next step? Run ahead to the next
 (10) problem
 (11) It was nevertheless a mistake to have left the bridge
 (12) That's why we - we Exxon stipulated that that was
 (13) negligence That's why we accept responsibility to pay actual
 (14) damages not punitive damages, but actual damages That's
 why
 (15) we stipulated to that
 (16) Now punitive is a different question And when you look
 (17) at that question I want you to remember that there was a
 (18) policy Mr Chalos is fond of telling you that the issue is
 (19) Watch Condition C Well, there's another part of the manual I
 (20) wish you'd look at and that's section 2 1 5 Our policy was
 (21) clear The master should be on the bridge in situations like
 (22) this and it's clear that we enforce that policy that there was
 (23) an awful lot of discussion with the masters - remember the
 (24) one man error conversations? It was a policy, it was enforced
 (25) it was meant to be followed

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(1) We also had a policy of upholding the Coast Guard
 (2) regulations, and of course the four hour rule would come within
 (3) that although I'm sure that Captain Hazelwood's violation of
 (4) that, as he told you was clearly inadvertent he didn't mean
 (5) to He was relying on the sailing time that was posted up
 (6) there
 (7) But this mistake of leaving the bridge this negligence and
 (8) the final analysis and even in hindsight is a far, far cry
 (9) from reckless conduct What if the evidence were in this case
 (10) that Captain Hazelwood went below because he had stomach
 cramps
 (11) or a migraine headache? We would already be in phase two
 (12) wouldn't we?
 (13) Let me steal a page from Mr O'Neill's book Let me state
 (14) a proposition for you To connect alcohol to this grounding
 (15) which is the main effort that they've tried in this case, there
 (16) must be proof that Captain Hazelwood went below because of
 (17) alcohol Doesn't that make sense? Of course it does If
 (18) you're going to connect it up, you better put some proof on
 (19) What's the proof?
 (20) Well, Captain Hazelwood testified that he went below in
 (21) order to plan his next problem he had to figure on where to
 (22) take the storm, he had to figure on how he was going to arrive
 (23) in Long Beach There's some corroboration of that
 (24) Mr Delozier remember, said he found some papers on
 (25) Captain Hazelwood's desk, and you also remember the
 testimony

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(1) that Mr Chalos just mentioned from Mr Lertz about the storm
 (2) that came two days later
 (3) That's pretty solid proof, corroborated
 (4) Then you have the plaintiffs' expert Dr Smith Dr Smith
 (5) said that in doing his analysis he assumed that there was no
 (6) drinking by Captain Hazelwood from the time that he got on that
 (7) vessel until the time that his alcohol - his blood alcohol was
 (8) taken at 10 00 in the morning No drinking Now, what do they
 (9) have against that? They have Scott Conner Scott Conner
 (10) testified - this is the only proof they've got Scott Conner
 (11) testified that sometime around 10 00 in the morning, after the
 (12) grounding he saw a half drunk bottle of Jack Daniels sitting
 (13) out there in plain sight
 (14) Now, no matter that it's out there in plain sight where ten
 (15) or more people have been all morning long, three of whom are
 (16) law - two of whom are law enforcement officers who have been
 (17) searching diligently for signs of alcohol and all the rest of
 (18) the people in there looking at this wide open space where
 (19) Mr Conner says he saw a bottle of Jack Daniels Mr Conner is
 (20) a strange young man and he has a strange memory
 (21) But the plaintiffs' theory of course so therefore
 (22) obviously there's no proof whatsoever Captain Hazelwood went
 (23) below to drink Their theory, though, is more general than
 (24) that They want to gloss over those facts and they want to say
 (25) simply that he was an alcoholic, that he was impaired and

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- (1) that a why he went below He's not a alcoholic he wasn't
 (2) impaired
 (3) Captain Hazelwood believed he had resolved the problem of
 (4) getting the turn executed and he went below to work on a more
 (5) complicated problem involving the storm, the tides distance
 (6) time and speed That is not the type of choice nor the type of
 (7) thought process that a person impaired by alcohol makes Just
 (8) the opposite That's the evidence
 (9) Now, I want to briefly cover three more things with you
 (10) then I'll sit down
 (11) First of those is Mr O Neill says we try to blame
 (12) Cousins Well, remember, the very first thing Mr Lynch told
 (13) you in the opening was we are responsible, we will pay for the
 (14) mistakes you will determine how much in phase two We
 (15) accept
 (16) that blame he was our employee he was where he was
 (17) supposed
 (18) to be and he was doing the duties he assigned This is not
 (19) shifting the blame Who took the blame? Mr Cousins did and
 (20) that whole business about everybody from Exxon lies doesn't
 (21) work on Mr Cousins because Mr Cousins, when he testified
 (22) was not an Exxon employee, hadn't been an Exxon employee
 (23) since
 (24) 1990
 (25) Two other quick things - I hear you - Mr O Neill told
 (26) you in opening that Mr Kagan had trouble hearing, seeing and
 (27) steering That's a lawyer's human error No proof of hearing,
 (28) no proof of sight, and the steering issue, you heard the proof

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- (1) on that and the obvious proof from the record from the course
 (2) recorder Kagan did his job that night
 (3) Finally they gave you this theory about fatigue That's a
 (4) good one They take the absolute uncontradicted evidence of
 (5) the people involved that he was not tired, he said he was not
 (6) tired the observer said he wasn't tired, they bring in this
 (7) expert he's never seen these people wasn't there, says, I
 (8) know more than they do he was tired Then you find out that
 (9) the basis for that was he assumed that Mr Cousins had a sleep
 (10) debt although he had to admit he didn't know how Mr Cousins
 (11) had slept the week previous to that
 (12) I will not waste anymore time on this analysis and
 (13) Wonderland theory of fatigue With that and a sincere thank
 (14) you for the time care and attention you have given all three
 (15) sides, I will sit down and let you hear from Mr Neal
 (16) **CLOSING ARGUMENT BY MR NEAL**
 (17) **MR NEAL** May it please the Court, counsel Ladies
 (18) and Gentlemen of the Jury
 (19) I do have some areas to cover, but before I do that I want
 (20) to address two things that Mr O Neill brought to your
 (21) attention One involved the video you have seen, principally
 (22) of Mr Rawl
 (23) Mr Rawl is now retired from Exxon and, shortly after the
 (24) grounding he's being hounded by Congress he's being
 (25) hounded
 (26) by the media to give them answers He doesn't have the

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- (1) answers We're talking about - we're talking at a few days
 (2) after the grounding Plaintiffs have been in this case now for
 (3) five years We have been in this case for five years We
 (4) still don't know all the facts What Mr Rawl tried to do was
 (5) to give him the information he had a few days after the
 (6) grounding and he did He didn't know there was something
 (7) wrong
 (8) with this blood alcohol test and he didn't know a lot of other
 (9) things at that time He gave them what he had at that time,
 (10) and he had the courage to come up here - we couldn't have
 (11) brought him up He had the courage to come up here and say
 (12) to
 (13) you, members of the jury, I was talking when I didn't really
 (14) know what I was talking about I didn't really have the facts
 (15) that have now been developed
 (16) The plaintiffs would try to say that he's lying I think
 (17) you saw Mr Rawl on the stand I don't think you say he's
 (18) lying I think he had courage to come to do that and I
 (19) personally appreciate it
 (20) While I'm into that, I've been in this trial lawyer
 (21) business a long time, longer by far than Mr O Neill and it
 (22) pains me a little bit to have a lawyer stand up and say, Oh,
 (23) all of these people on that side are lying All of these
 (24) people on that side are shaving the truth except - except
 (25) and here's what he relies on he relies on Dr Montgomery, Dr
 (26) Nealy, Dr Gould, Captain Duncan Mr Day, Captain Stalzer
 (27) Mr Kunkel and a host of others who are also Exxon employees

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- (1) now those employees aren't lying He likes what they have to
 (2) say
 (3) The people at Exxon he accused of being liars are the
 (4) people who say things he don't like Well, truth of the matter
 (5) is in my business, very few people come in here and lie to
 (6) you They could be mistaken We started talking about this
 (7) event after the grounding, they have to go back five and six
 (8) years to remember that incident That's very hard to do I
 (9) don't think the people on Mr O Neill's side came in here and
 (10) lied to you And I don't think the people he accused of lying
 (11) and shaving the truth were lying That's not been my
 (12) experience
 (13) Even Mr Shaw - and I'll get to Mr Shaw in a minute
 (14) Even Mr Shaw, I can demonstrate to you, and I will, that
 (15) Mr Shaw is mistaken That what he's told you was not
 (16) accurate
 (17) I don't believe he's lying I believe he's - I believe
 (18) he's mistaken, I believe he's got something in his mind, I
 (19) don't know why, but I don't think he's getting on - taking the
 (20) oath in the Court of United States and lying to you, just lying
 (21) to you People just don't do that We don't do it and I
 (22) wouldn't accuse his witnesses of doing it
 (23) Now, having said that, I want to tell you something about
 (24) the law in this country Exxon, at the time of the grounding,
 (25) was a corporation that had a hundred thousand employees A

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- (1) hundred thousand That's a big city, at least for a country
- (2) boy like me Exxon is responsible for every one of those
- (3) employees If any one employee commits an act of simple
- (4) negligence and that act of simple negligence causes damages
- (5) Exxon is responsible for paying those damages for the whole
- (6) hundred thousand employees
- (7) And let me tell you this that is what this case is about
- (8) One or two of those hundred thousand Exxon employees committed
- (9) simple acts of negligence and that led to this grounding
- (10) Plaintiffs have been trying now for five years to turn this
- (11) into a case for punishment a case for punitive damages To do
- (12) that, they've got to show that we acted recklessly and with
- (13) calloused disregard of the rights of others
- (14) Ladies and gentlemen we didn't build \$130 million
- (15) state-of-the-art tanker put \$16 million worth of crude oil on
- (16) it and recklessly and callously turn it over to a drunk
- (17) They've called us everything in the world in this case except
- (18) stupid, and we ain't that stupid We can make mistakes but we
- (19) ain't that stupid
- (20) Now I'm not that lawyer talking about in the video or
- (21) asking about we don't want a lawyer getting up here and denying
- (22) responsibility We do not deny our responsibility We accept
- (23) responsibility We accept responsibility for each and every
- (24) dollar of actual damages which you will determine in phase two
- (25) was caused by our negligent acts But we don't accept that we

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- (1) were reckless and we don't accept that we acted in callous
- (2) disregard of others
- (3) Now let me go to the points I want to cover
- (4) Mr. - The plaintiffs not only after going through the
- (5) voyage and saying that Captain Hazelwood was impaired and his
- (6) impairment led to the grounding and all that they then swing
- (7) back and say, And Exxon had a reckless alcohol policy Exxon
- (8) was reckless in returning Captain Hazelwood to duty and Exxon
- (9) was reckless in monitoring
- (10) The truth of the matter is if you eliminate the tumult and
- (11) the shouting and you eliminate questions which, in this case in
- (12) large part have substituted for the testimony of witnesses I
- (13) suggest to you, number one, that the alcohol policy of Exxon
- (14) was the norm in the industry, better than - better than most
- (15) and that it was approved on that stand by the plaintiffs' own
- (16) expert Dr. Masters
- (17) Number two the return of Captain Hazelwood to duty was a
- (18) tough thoughtful decision but it was taken in the sincere
- (19) belief that by doing that we would reduce the overall risk
- (20) that's associated with driving people who might have a problem
- (21) of alcohol into the ground
- (22) And number three in regard to monitoring Captain
- (23) Hazelwood was out of this rehab thing for four years before the
- (24) grounding And in regard to that, even though - as you have
- (25) seen from charts presented here you can see them again in

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- (1) deliberation - over 500 people had access to Captain Hazelwood
- (2) in those four years, we have three incidents or three events
- (3) that we need to talk about
- (4) Exxon as a corporation recognized in 1977 that alcohol in
- (5) the workplace was a problem, it adopted a policy in 1977 -
- (6) even 10 years later in 1987 - in a business, roundtable
- (7) survey that you heard about here - more than half of a hundred
- (8) and fifty of the major companies in the country didn't even
- (9) have an alcohol policy, and even today even at the time of the
- (10) grounding in this case even at the time of the grounding in
- (11) this case, the United States Coast Guard has no policy
- (12) prohibiting possession or moderate drinking of alcohol on board
- (13) a vessel
- (14) Is this reckless? Is this callous?
- (15) Over the years, we improved our policy We increased
- (16) guidelines for monitoring for our supervisors We added
- (17) testing for applicants for job applicants We added for-cause
- (18) testing of existing employees And we continued, over the
- (19) period of time random searches Now, plaintiffs' experts -
- (20) and you know we've had in this case a lot of experts They're
- (21) paid witnesses The judge will have an instruction on how you
- (22) look at experts What I want to do, because I think it shows
- (23) that you can rely on this, I want to rely not on our experts, I
- (24) want to rely on plaintiffs' experts, because if I as defense
- (25) counsel rely on plaintiffs' experts, that ought to be something

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- (1) that we can all rely on
- (2) In regard to our alcohol policy Dr. Masters, plaintiffs
- (3) expert, said - but before perhaps I say that, I should tell
- (4) you the five critical elements of our alcohol policy
- (5) One we as far back - and continuing all the way through
- (6) the grounding - far back as 1977 we prohibited the use and
- (7) possession of alcohol on our vessels We did that 11 years
- (8) before the Coast Guard initiated this four-hour rule And even
- (9) at the time of the grounding, the Coast Guard doesn't go as far
- (10) as we do
- (11) Second, we said alcohol problems can be treated
- (12) Third we said you seek help if you have a problem and we
- (13) won't jeopardize you in your job And the reason for that is
- (14) if it's a problem in the workplace, the problem is greater from
- (15) people who don't seek help and hide their problem in the closet
- (16) than it is from those who seek and get help and complete the
- (17) course satisfactorily So in order to - to avoid a risk we
- (18) said seek help and we won't penalize you in your job
- (19) And finally we said - we said We will respect your
- (20) privacy rights, your confidentiality
- (21) Now let me go to Dr. Masters' plaintiff expert Says yes,
- (22) a company should have an alcohol policy Yes alcohol can be
- (23) treated, yes you should encourage self-identification and,
- (24) yes you should have confidentiality The very elements of our
- (25) alcohol policy and regard to confidentiality, he agreed with

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- (1) us we don't want a Scarlet A put on everybody's forehead
 (2) Now there was a criticism. There was one criticism by
 (3) plaintiffs' counsel that was not - that was not supported by
 (4) any evidence. Plaintiff counsel seemed to suggest you should
 (5) put people on shoreside assignments for a while but no witness
 (6) said this and Dr. Masters - the plaintiffs' expert - whole
 (7) career has been centered on getting pilots back in the air
 (8) right after rehab.
 (9) Now Dr. Masters says his criticism, his one criticism was
 (10) well you don't have a written plan for monitoring, but when we
 (11) confronted him with our plan look what he says. He says -
 (12) and the question is, But you do agree that good monitoring
 (13) program would involve advising the supervisor watch and be
 (14) the eyes and ears of the medical department.
 (15) Yes.
 (16) And they should look for things such as slurred speech or
 (17) absenteeism or frequent injuries or other signs that the
 (18) profession has recognized is indicative of possibility of
 (19) alcoholism is that true?
 (20) Answer, Yes.
 (21) And rather than diagnose it they should refer it to the
 (22) medical department?
 (23) Answer. By all means and here's the key.
 (24) Question. And the writings you saw in Exxon recommended
 (25) that Exxon's supervisors do exactly follow exactly those

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- (1) standards isn't that true, sir?
 (2) Answer. Yes.
 (3) And then plaintiffs' counsel got up and tried to resurrect
 (4) him and - and they asked this question.
 (5) Question. There were no guidelines in those papers with
 (6) respect to monitoring, is that correct?
 (7) You know what his answer is? Look at it. The word, I
 (8) could not find the word.
 (9) So apparently the only criticism Dr. Masters had of our
 (10) alcohol policy is that he couldn't find the word monitoring.
 (11) Plaintiffs then got into well you don't have post rehab
 (12) testing. Now we didn't and let's see what Dr. Masters said
 (13) about post rehab testing.
 (14) I won't go over it all but I'll give you a check. I'll
 (15) leave it up there so you can make sure I'm not putting half
 (16) truths up there or anything.
 (17) Question. Okay let me - let me just go into that for a
 (18) second. Your view is that you're opposed to periodic or
 (19) unannounced or random testing, is that correct?
 (20) Answer. That's been my view for years, especially of
 (21) alcohol testing.
 (22) Question. Of alcohol testing in particular?
 (23) Answer. Yes, sir.
 (24) Now in the preceding paragraph he talks about up here
 (25) just above the yellow he talks about a possibility of testing

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- (1) if there was a reported problem. Well that's what for-cause
 (2) testing is about. And our policy does provide for for-cause
 (3) testing.
 (4) Now let me move to - let me move to quickly, if I can to
 (5) try to put the situation with Captain Hazelwood - I've talked
 (6) generally about our alcohol policy. I've talked generally
 (7) about that. I want to put Captain Hazelwood's situation in the
 (8) context, now, of our alcohol policy.
 (9) In March 1985 late March 1985 Captain Hazelwood - as you
 (10) know in that job you have 60 days on, 60 days off and the 60
 (11) days off you go home. Captain Hazelwood was at home in that
 (12) 60 days off in late March 1985.
 (13) He gets a call from Captain Pierce, his friend, and Captain
 (14) Pierce told you, I called him not as an employer but as a
 (15) friend. Captain Pierce had received an anonymous call from
 (16) somebody who said Captain Hazelwood is moody, more moody
 (17) than
 (18) usual. Mr. Pierce, who said, I didn't know anything about
 (19) drinking, no drinking was mentioned. I called Captain
 (20) Hazelwood and said, Captain, if you've got a problem get
 (21) help. If you don't have a problem we'll handle it.
 (22) Captain Hazelwood then on April 1, 1985 went into South
 (23) Oaks Hospital. On April 28, 1985, he successfully completed
 (24) that course.
 (25) Now this self-identifier business, Captain Hazelwood was
 (26) asked on the stand if he were a self-identifier, and he said

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- (1) no. You read his entire testimony, however, as I have and you
 (2) see that what he meant, what he thought a self-identifier was
 (3) is that before he goes into South Oaks he has to tell the
 (4) company, I'm going into South Oaks and getting help. That's
 (5) not what a self-identifier in the program is called.
 (6) Self-identifier says to himself, I've got a problem and I'm
 (7) seeking help, and Captain Hazelwood was a self-identifier.
 (8) Now let's - he then goes through, he successfully
 (9) completes the program and let's see what happens then. Well
 (10) the thing that happens then is that - but let me start first
 (11) with the diagnosis because I have to cover that, just a touch
 (12) of that.
 (13) Dr. Vallury, the man at South Oaks who has Hazelwood for
 (14) analysis for 28 days diagnoses Captain Hazelwood as suffering
 (15) primarily from dysthymia, mild depression and, secondarily,
 (16) alcohol abuse episodic but then, you know, a strange thing
 (17) happens then. The plaintiffs bring on a Mr. - a Dr. O'Connor
 (18) as their expert who says Oh, Dr. Vallury is wrong. I don't
 (19) believe that. I believe Captain Hazelwood was an alcoholic.
 (20) Now, they asked him, How do you know? Well, I know because
 (21) I was here a few days in court and I observed Captain
 (22) Hazelwood
 (23) in court.
 (24) Well, Ladies and Gentlemen of the Jury, you've been here
 (25) 30-some days. And you've observed him in court. You make
 (26) your
 (27) diagnosis.

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- (1) Not only that, not only that plaintiffs expert was not
- (2) in - plaintiffs' expert, Dr Masters when they called Dr
- (3) Masters who does he say is right? He endorses Dr Vallury
- (4) He says - and I'll do this quickly, too - he says I have a
- (5) high opinion of South Oaks Hospital
- (6) That's where you send your tough cases?
- (7) Answer There and a couple of other places
- (8) And then he says, Yes, I met Dr Vallury
- (9) Question And you had reports in the course of your
- (10) monitoring you received from Dr Vallury?
- (11) Oh yes, sir Yes, sir yes, sir
- (12) You relied on those reports correct?
- (13) Yes
- (14) So there's plaintiffs' own doctor saying, I rely on Dr
- (15) Vallury, and you can, too His diagnosis is dysthymia mild
- (16) depression alcohol abuse episodic, not alcoholism And I can
- (17) agree with Mr Chalos, you can say it a thousand times, doesn't
- (18) make it true
- (19) Now, then what happens, Dr Vallury and Dr Montgomery have
- (20) a conversation, and Dr Vallury says to Dr Montgomery - they
- (21) admit one of the employees they say is telling the truth
- (22) Dr Vallury, Dr Montgomery says tells him Captain
- (23) Hazelwood is fit for duty now but I want you to give him a
- (24) leave of absence so he can complete his aftercare And a leave
- (25) of absence was granted

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- (1) Now plaintiffs apparently complain that a corporate doctor
- (2) should come in here and say No forget your private physician
- (3) I'm going to make my own diagnosis I don't think anybody
- (4) would agree that a corporate medical department should be
- (5) able
- (6) to overrule your own private physician
- (7) One other thing Mr O Neill has said he has said that we
- (8) should have gotten the medical records from South Oaks Well
- (9) I'm going to ask you to do this I'm going to ask you - I
- (10) think I'll get it here but I think it's the Court's
- (11) instruction number
- (12) MR SANDERS 41
- (13) MR NEAL 41
- (14) I'm asking you - you've taken a lot of notes in this and
- (15) I do appreciate it very much I'm asking you to make one more
- (16) note at least and look at instruction - the Court's
- (17) instruction number 41 regarding getting medical records
- (18) Now then the next thing that happens is that - the
- (19) question is what do we do about Captain Hazelwood He self
- (20) identified - self identified, he has sought help he's
- (21) completed the course successfully his private physician says
- (22) he's fit to go to sea duty Now what happens?
- (23) Well Dr Graves - I mean Mr Graves and Dr - and
- (24) Mr Iarossi have a conversation Now one thing they do in
- (25) this, one thing I need to hit here in this conversation they

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- (1) violated our policy in the past, and Mr Graves says Yes but
- (2) that was years before Since then he's self-declared he's
- (3) gone in he's gotten help, and it wouldn't be fair to hold
- (4) those ancient violations against him He fits the policy
- (5) That's what Mr Iarossi has said
- (6) Now then Mr Iarossi still doesn't - has a question about
- (7) putting Hazelwood back as the master of a tanker He says I
- (8) didn't really want to do it And then Mr Graves - then
- (9) Mr Graves says, Frank think about this Three things The
- (10) policy requires it, the law requires it - and I'll get to the
- (11) law in a minute and if you don't return Captain Hazelwood to
- (12) his job, you will never have another officer out there on our
- (13) vessels self-identifying and seeking help You will drive the
- (14) problems into the closet
- (15) Now, alcohol in the workplace is a problem You will drive
- (16) that problem into the closet It was a tough decision, and
- (17) Mr Iarossi said to you, it is a tough decision We're going
- (18) to run a risk either way We are weighing our risks It's a
- (19) tough decision, but I thought on balance that we would run a
- (20) greater risk to society if we didn't return Captain Hazelwood
- (21) than if we did return him
- (22) You may decide in retrospect that's a wrong decision I
- (23) don't know I don't know today, but I submit to you and I
- (24) suggest to you, you can't say it was callous disregard of a
- (25) risk You can't say it was a reckless decision

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- (1) Now I'm reminded - just occurred to me just then, I'm
- (2) reminded of the words of Admiral Yost in this regard You know
- (3) what he said? It's impossible for you to remember everything
- (4) I know it so I'm going to remind you of this and maybe some of
- (5) you will think about it be able to get it in the jury room
- (6) Admiral Yost says You can't ruin a man's life on facts not
- (7) known at the time Oh if we could all just be plaintiffs
- (8) counsel and look backward from an event, wouldn't we all be -
- (9) wouldn't we all be - wouldn't it be great?
- (10) So the decision was made to return Captain Hazelwood to
- (11) duty At this point I submit we had a proper alcohol policy
- (12) endorsed in this courtroom by plaintiffs' own expert, that we
- (13) made a tough but-sincere decision sincerely believing that we
- (14) reduced the risks, and finally, Captain Hazelwood goes back to
- (15) duty
- (16) He has a meeting with Mr Tompkins - and Mr Tompkins, it
- (17) was a tough meeting Mr Tompkins has his alcohol policy
- (18) there
- (19) and he says to Captain Hazelwood, Look here's the alcohol
- (20) policy You better be on the straight-and-narrow And Captain
- (21) Hazelwood said it was a tough meeting Captain Hazelwood
- (22) said
- (23) as you remember, I knew I was going to be watched
- (24) Captain Hazelwood was then assigned, then assigned to the
- (25) Yorktown as master, back as master of the Yorktown Why did

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(1) that right now
 (2) Plaintiffs' counsel suggests that there was some sort of
 (3) economic motive for us to do this He suggests he says the
 (4) record reflects that there was a shortage of people in the
 (5) company with master s license Let s look at the facts
 (6) because that is simply wrong I do not accuse plaintiffs'
 (7) counsel of - I do not accuse plaintiffs' counsel of
 (8) deliberately distorting the facts It s simply wrong Let s
 (9) look what Captain Hazelwood said matter of fact The question
 (10) is would it be fair to say that there was a shortage of
 (11) masters in the fleet
 (12) There was a shortage possibly of promoted masters There
 (13) was plenty of relief masters around And then he goes on to
 (14) describe a situation Plenty of relief masters around And
 (15) you know what happens then of course, they immediately
 (16) change
 (17) the subject as you see on down there
 (18) Now, I suggest to you that we reassigned Captain Hazelwood
 (19) because we thought it was the right thing to do It would have
 (20) been the easiest thing in the world to say, Get lost Captain
 (21) Hazelwood you ve been with us for almost 20 years get lost
 (22) I can find no motive for us doing it, and I suggest to you
 (23) now that we think it was the right thing to do We thought on
 (24) balance it would be a reduction of risk not a creation of one
 (25) Now then then we get to - they say, We were reckless in
 (26) monitoring Captain Hazelwood Well let me submit to you one

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(1) thing If I don t leave you with anything else let me - let
 (2) me submit this to you
 (3) We didn t have to - have to monitor Captain Hazelwood at
 (4) all according to plaintiffs own expert Dr Masters Now
 (5) remember remember Captain Hazelwood has been diagnosed
 (6) first
 (7) primarily with dysthymia - I m going to call it mild
 (8) depression from now on because I can't pronounce the word -
 (9) mild depression primarily, and alcohol abuse episodic
 (10) secondary And you have heard, you've seen on the screen
 (11) that
 (12) plaintiffs own expert Dr Masters endorsed the professional
 (13) competence of Dr Vallury Now let's see what happens here
 (14) It is true is it not, Dr - let me read, this is so
 (15) important let me read the whole thing
 (16) So if they made the determination that a pilot was
 (17) suffering from dysthymia primary problem alcohol abuse
 (18) episodic secondary problem then that pilot could continue to
 (19) fly isn t that correct?
 (20) Answer, That requires a lot of assumptions that you haven t
 (21) given me
 (22) Isn't it true - it is true is it not Dr Masters that
 (23) that is - that if the FAA concurred in a diagnosis of
 (24) dysthymia and alcohol abuse episodic that the FAA regulations
 (25) would not cause for the cancellation of the pilot s license?
 (26) Answer If the FAA concurred in that yes
 (27) You know what he s saying there and the rest of it he s

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(1) saying if that's all that s wrong with the pilot he wouldn t
 (2) have to be monitored He d be put back immediately in the
 (3) cockpit of a 747
 (4) So the answer is we didn't have to monitor Captain
 (5) Hazelwood at all But Mr Iarossi says watch him so we did
 (6) Now then what happens, what about next? What do we look
 (7) for? Well, the proof in this case is that you look for job
 (8) performance You don t run around and snoop in a man s - go
 (9) up to Long Island where he lives and look in his garbage can
 (10) destroy his life You look at - what do you do?
 (11) Look at your job performance And that s all we really
 (12) could look at because let me tell you about a law - and
 (13) you ll get this, you ll get this from the Court and I m going
 (14) to take the liberty with the Court of putting up one of its
 (15) instructions here, because it says it and I do not want to say
 (16) it -
 (17) When you get to talking about what the Court s going to
 (18) charge, Judge Holland is just like every judge, they get pretty
 (19) doggone - pretty doggone touchy if you get over in their
 (20) territory about the law and I don t want to do that At the
 (21) time that Captain Hazelwood, all the time prior to the
 (22) grounding, there was an act called the Rehabilitation Act of
 (23) 1973 And it said it says under the terms of this act The
 (24) history of alcoholism or alcohol abuse is treated as a handicap
 (25) and a employer covered by the act is not permitted to

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(1) discriminate against any employee solely on the basis of that
 (2) history If on the other hand, employee's current use of
 (3) alcohol prevents the employee from performing his job from
 (4) performing his job or if current use would constitute a direct
 (5) threat to the property of others, then the employee is not
 (6) covered
 (7) Now, what is that telling us? That s telling us that there
 (8) is a federal statute and there s no question that Exxon was
 (9) bound by that federal statute That federal statute to me -
 (10) and I suggested it should to you - said the way you monitor a
 (11) guy is you look at job performance
 (12) Now then, we ve - we ve said about - we ve said what -
 (13) I m going to skip the next one We ve said what Dr Masters
 (14) said How do you go about - what do you - how do you go
 (15) about
 (16) monitoring? We've shown you on the screen that he says the
 (17) Exxon program was monitoring was correct You look the
 (18) supervisors become the eyes and ears of the medical
 (19) department
 (20) they look for slurring of speech, absenteeism on the job, bad
 (21) performance on the job, and if they see a problem, they take it
 (22) to the medical department
 (23) And Mr Lynch said, Dr Masters, look at these papers
 (24) isn t that exactly what we provide? And he says yes then he
 (25) goes on and says, Except I didn't find the word monitoring
 (26) So I m not going to go over that again
 (27) Now, then Captain Hazelwood is in the Gulf Coast fleet and

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- (1) he is assigned to the Yorktown He s there from 1985 to 1987
 (2) Do you know two years - you know there was one report in two
 (3) years of this so-called bumbling drooling alcoholic
 (4) One report to the supervisors, to the people who supervise
 (5) Captain Hazelwood and that was the Shaw report Jim Shaw
 says
 (6) that he smelled alcohol on Captain Hazelwood s breath
 sometime
 (7) in 1986 and he reports that to Mr Sheehy What does
 (8) Mr Sheehy do?
 (9) And here s another place I have a disagreement with
 (10) plaintiffs counsel What does Mr Sheehy do? He goes to Joe
 (11) Hazelwood and he says, Captain Hazelwood have you been
 (12) drinking? And he investigates and he reports back to Mr
 Koops
 (13) that, I can t find any substance to the Shaw report
 (14) But that s not all that is done there Mr Sheehy then
 (15) contacts Captain Mihajlovic, and Captain Mihajlovic is the big
 (16) guy that came in here to testify, and Mr Sheehy says to
 (17) Captain Mihajlovic, Captain, I ve got this thing from Shaw that
 (18) Captain Hazelwood is drinking, would you check it out?
 (19) Mihajlovic down at Chiriqui Grande, their boats are there
 (20) together, he says, I decided to pull a surprise visit to
 (21) Captain - to Captain Hazelwood
 (22) I took a boat I went to his boat I went down there and I
 (23) said Joe, there s this Shaw rumor that you been drinking He
 (24) says Captain Hazelwood got mad he was not expecting him to
 (25) be

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- (1) Captain Hazelwood got mad, said, There s nothing to it but
 (2) if you don t believe it, search my quarters
 (3) So Captain Mihajlovic then proceeded to ransack his
 (4) stateroom and his office, opening drawers found nothing And
 (5) then he reported back, so you told him that this Shaw report
 (6) rumor - he s talking about going back to Sheehy how, as you
 (7) see whatever you're talking about was a bunch of baloney
 (8) And Captain Mihajlovic says, in those words - I think you
 (9) could judge by what you saw about Captain Mihajlovic here that
 (10) he is not a man that will get on that stand and lie and he s
 (11) sure not a man - he s too big for me to even suggest it so I
 (12) don t think he d take that kindly, either
 (13) Now then, Mr Shaw made some other allegations but he -
 (14) even he admits this was the only one he reported to
 (15) supervisors He said in his other allegations he - he said
 (16) that he was with Mrs Share, Mrs Pennington a man named
 Jesse
 (17) Watts and a man named DeOliveira Mrs Share took that
 witness
 (18) stand nice little girl, Leslie Pennington took that witness
 (19) stand and says those events didn't happen Mr Watts and
 (20) Mr DeOliveira by deposition testified that they didn t
 (21) happen
 (22) Now then, here s where I m really going to ask you to take
 (23) another note save us all time, you can look at it in the jury
 (24) room rather than me going over it I can - I can demonstrate
 (25) to you that these Shaw - other Shaw reports are inaccurate by

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- (1) this
 (2) Mr Shaw testified here Mr Sanders asked him he said
 (3) These events occurred in Baytown while the Yorktown, with
 (4) Captain Hazelwood aboard it, he said they occurred in Baytown
 (5) while the Yorktown was there and Captain Hazelwood was
 master
 (6) and he said they occurred seven to 14 days apart each time
 (7) Seven to 14 days apart
 (8) If you will look at exhibit Defendants Exhibit 7020, you
 (9) will see that there was never, ever, ever a time that the
 (10) Yorktown was in Baytown with Captain Hazelwood aboard in
 seven
 (11) to 14 days, not double that Most of the time, it was more
 (12) than 50 to a hundred days
 (13) And finally, the Mr Watts' thing, Mr Shaw said that
 (14) Mr - that the event involving Mr Watts occurred while
 (15) Mr Watts was sailing with Captain Hazelwood on the Yorktown
 (16) If you will look at Exhibit 3467 A Alpha, you will see that
 (17) Mr Watts did not sail with Captain Hazelwood on the Yorktown
 (18) after February 1985 before the rehab
 (19) Now, Captain Hazelwood says to you that he did start
 (20) drinking socially again He said it was May, 86 and, well,
 (21) plaintiffs said he did it openly
 (22) Well I just want you to note in passing that Captain
 (23) Hazelwood told you, I was in a lot of conferences that lasted
 (24) several days with my supervisors all these fleet conferences
 (25) and I'd go out to lunch and dinner with them and I only drank

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- (1) Pernier on those occasions To me that means Captain
 (2) Hazelwood knew that he was being watched and knew that the
 (3) company was serious about it
 (4) Then there comes a time when there is a vacancy on the West
 (5) Coast and there's a chance for somebody to move over and
 (6) replace this master who is the alternate master of the Valdez
 (7) Mr Martineau came to Mr Borgen who was the West Coast
 fleet
 (8) manager and says I think we ought - I ve talked to Bill
 (9) Sheehy on the Gulf Coast I think we ought to promote Captain
 (10) Hazelwood He has big ship experience, he knows the Valdez
 (11) trade he has a pilotage endorsement he is a good ship
 (12) handler, he gets along with his crew
 (13) Mr Borgen says, because he knows there s somewhere back
 in
 (14) the past some alcohol problem, he says I ll think about it
 (15) He then calls Mr Koops, says, What about Joe Mr Koops,
 (16) who was the Gulf Coast fleet manager said, Two years he s
 been
 (17) clean he s been clean he s done a great job so Mr Borgen
 (18) accepts him But that s not all that - that's not all that
 (19) happens
 (20) Mr Borgen still wants to watch Captain Hazelwood, so he
 (21) goes to a Mr Larson his agent down in Long Beach - because
 (22) that s where the vessel will stop in the trade - and he says
 (23) to Mr Larsen Joe has had this kind of a problem sometime
 (24) years back in the past but I still would like you to look at
 (25) him, watch him, go on board the vessel talk to him, talk to

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(1) others about him and report back to me
 (2) Now Mr Larsen when he testified here was not an Exxon
 (3) employee He was the captain - he was the president of his
 (4) own company He said that every time then that the Valdez
 (5) was in Long Beach he'd board the vessel he'd talk to Joe he'd
 (6) talk to crew he would talk to the pilots and say How's Joe
 (7) doing, and he would look at his performance And he reported
 (8) back to Mr Borgen time and time again everything was fine
 (9) That's not all Mr Borgen did He got Mr Myers, who was
 (10) immediate supervisor beginning in '88, and he asked Mr Myers
 (11) to look at Joe And Mr Myers, you heard went aboard the
 (12) vessels every time spent days on the vessel slept on the
 (13) vessel talked to crew members on the vessel
 (14) Captain Hazelwood - some of us it was kind of amusing time
 (15) because some of you people were young enough that you
 (16) didn't remember it, but Captain Hazelwood said, He was my shadow
 (17) my
 (18) Lamont Cranston who was the man who played - was the
 (19) character was the shadow in the series
 (20) Now, there are two events here I want to tell you about
 (21) one is the Henry's, the ordering Henry's or ordering beer over
 (22) a walkie talkie while the Valdez was up out of the water in
 (23) dry-dock in the Portland Shipyard in 1988
 (24) Mr Leyendecker Mr Day heard Captain Hazelwood ask about
 (25) beer over the walkie talkie, and the next day Mr Leyendecker
 (26) went to the vessel to investigate

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(1) And then he calls Mr Borgen and Mr - and he says,
 (2) Mr Borgen we had this incident I've investigated I went to
 (3) the vessel I think everything's fine Joe told me that the
 (4) beer was not for him not to come aboard the vessel it was for
 (5) a crew party ashore that night I can report to you it's
 (6) fine
 (7) He also told - Mr Leyendecker also told Day that - Day
 (8) asked or he told Day about that and he said to Day the same
 (9) thing I've investigated Joe denied he was drinking,
 (10) everything is fine
 (11) This is not reckless conduct What is this if it's not
 (12) monitoring?
 (13) But that's not all Mr Myers then went to the vessel
 (14) The vessels came out of dry-dock and came to San Francisco or
 (15) Long Beach and Mr Myers went to the vessel and he went
 (16) aboard
 (17) the vessel and he's got this Henry's thing in his mind He
 (18) says Hello Joe Then he goes down and talks to the crew
 (19) Has Joe been drinking?
 (20) You heard this it's undisputed in the record Has Joe
 (21) been drinking The person he talked to I think it was the
 (22) chief engineer said no
 (23) Then Mr Myers goes back up, he spends four or five days -
 (24) or four or five hours talking to Captain Hazelwood, and then he
 (25) says to Captain Hazelwood, Joe, Do you have any problem at
 (26) all
 (27) do you have any problem at all?

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(1) Now Mr Myers said Joe knew what I meant He knew I
 (2) meant alcohol The plaintiffs have said that we didn't
 (3) question Captain Hazelwood about drinking or alcohol There
 (4) are three times already Sheehy Captain Mihajlovic
 (5) Mr Myers - four times, Mr Leyendecker
 (6) Now then we have the last incident the so-called launch
 (7) incident I tell you I submit to you that with all sincerity
 (8) at my command, my friend and colleague Mr O'Neill is wrong
 (9) when he said, stood up here and said that Mary Williamson said
 (10) Captain Hazelwood was drunk She never said any such thing
 (11) Indeed, I had that problem at the time with him She said
 (12) Captain Hazelwood I smelled alcohol on Captain Hazelwood's
 (13) breath on a launch going back from shore to the vessel and
 (14) Captain Hazelwood told you that that night, earlier on in the
 (15) evening he had had a couple of glasses of wine with dinner but
 (16) that's what Mary Williamson said, I smell alcohol She also
 (17) said that Captain Hazelwood was very, very angry with her
 (18) boss,
 (19) Captain Reeder, and was being - saying very unkind things
 (20) about Captain Reeder She told this to Mr Day
 (21) Mr Day says I went in to Mr Myers and I - we were
 (22) talking about superchargers and, after a long conversation I
 (23) told Mr Myers what Mary Williamson had said to me Mr Myers
 (24) says on the stand here clearly not lying, I was busy but all
 (25) I heard was nothing about Captain Hazelwood it was officer's
 (26) busting Reeder's chops That must be getting mad at
 (27) somebody

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(1) That didn't bother him because he said the masters were
 (2) jealous of Captain Reeder and didn't like him He stayed in
 (3) San Francisco Bay and they had to go on long voyages so that
 (4) wasn't really - that wasn't really something that got
 (5) Mr Myers' attention
 (6) And then Mr Day said, Mr Day said to you from his
 (7) deposition, you know, I'm not even sure that Mr Myers heard
 (8) me
 (9) when I was telling about Mary Williamson smelling alcohol on
 (10) Captain Hazelwood's breath These are the facts
 (11) So what do we have? I think I've got five minutes to tell
 (12) you what we have okay
 (13) We have - we have two incidents allegedly reported to
 (14) supervisors from '87 to '89, one of which was investigated
 (15) thoroughly and the other Mr Myers didn't hear Therefore
 (16) we've had one episode reported in - from '85 to '87 Two
 (17) episodes tried to be reported '87 to '89 That's it That is
 (18) it
 (19) Assume just a moment - and then I hope to stop in a
 (20) second Assume just a moment that Mr Myers had actually
 (21) learned as a fact - contrary to fact, had learned that Captain
 (22) Hazelwood was having a beer off shore, beer off duty, wine off
 (23) duty What could he have done? If you will look at this
 (24) instruction again that I put on the screen, what's the -
 (25) what's the number? I don't have the number of the
 (26) instruction It's the instruction about the - about the

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- (1) federal rehabilitation act
- (2) MR SANDERS 42
- (3) MR NEAL Look at instruction 42 Even - even if
- (4) Mr Myers had learned that Captain Hazelwood - Captain
- (5) Hazelwood was drinking some beer and some wine off shore
- (6) off
- (7) duty, not in violation of company policy, he could not have
- (8) disciplined him under the Federal Rehabilitation Act of 1973
- (9) unless he concluded that that was affecting his job performance
- (10) and constituted direct threat to the safety of others
- (11) Otherwise, he couldn't even have disciplined
- (12) Was it affecting Captain Hazelwood's job performance? I'll
- (13) tell you one more time Captain Hazelwood was the alt masters
- (14) in Valdez in '87 and '88, and what vessel got the fleet
- (15) manager's award for those two years? The Valdez What is that
- (16) based upon, safety? Safety first, as you've heard, and
- (17) performance That's what you get when you look at Captain
- (18) Hazelwood's performance, and I'll say this
- (19) Mr O'Neill made much of the fact that Mr Rouse said it
- (20) was possible, it was possible, remotely possible for relapsed
- (21) alcoholic to be at the tank [sic] of a - master of a vessel
- (22) Well, absolutely it's possible It's possible, Dr Masters
- (23) testified, under the federal AA plan Their theory is that if
- (24) you're an alcoholic which is not the case here - if you're an
- (25) alcoholic you can't ever drink again if you drink again

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- (1) alcoholic
- (2) Look at what Dr Masters said about that Dr Masters'
- (3) experts admitted that under the FAA policy, the one that
- (4) everybody's bragged about, plaintiffs bragged about so much
- (5) that you could be an alcoholic and there's nothing to prevent
- (6) you from drinking again
- (7) Finally let me - let me close here by saying this We
- (8) have - you can take that off
- (9) If we have - there's no way, for example you can prevent
- (10) that We've been here - we've been here a long time I've
- (11) been here a long time I'm going to leave with this thought
- (12) We've all seen mystery stories on television we've read
- (13) mystery stories They say to you Find the motive and you
- (14) solve the case What was our motive in returning Captain
- (15) Hazelwood to duty? Plaintiffs try to suggest we were short of
- (16) masters I've shown you that's not the proof Plaintiffs try
- (17) to suggest that he had a pilotage endorsement and therefore
- (18) we'd save money because he had a pilotage endorsement
- (19) You
- (20) have heard any number of testimony here now that you don't
- (21) need
- (22) a pilotage endorsement for Prince William Sound if you go
- (23) through a different ritual You declare yourself a non pilot
- (24) you do more reporting and so forth
- (25) Matter of fact Captain Hazelwood said in answer to a

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- (1) paid a master who had a pilotage endorsement \$350 for a trip to
- (2) Prince William Sound above his hundred thousand dollar
- (3) salary
- (4) So we had no motive to return Captain Hazelwood to duty
- (5) except, except we thought it was right for Joe and we thought
- (6) on balance after prayerful-almost consideration, it would not
- (7) increase a risk, it would reduce a risk because it wouldn't
- (8) drive people, undeclared people with alcohol problems into the
- (9) closet
- (10) And I think the Coast Guard agrees with me because I will
- (11) point out one more time, as Mr Chalos did as we sit here
- (12) today the United States Coast Guard has said that Captain
- (13) Hazelwood, you are fully licensed as a master for any size
- (14) vessel on any ocean, and that is - that is true now as I'm
- (15) talking to you I think if the Coast Guard thought he was a
- (16) risk of danger to others, they wouldn't do that
- (17) Now, I thank you very much I like my partner Jim
- (18) Sanders, thank you for your patients I've tried to stay
- (19) within the time I might be a minute or two more than that,
- (20) but I want to leave you with this thought this is the last time
- (21) I'll talk to you in this phase of the case
- (22) As the Judge says, the plaintiff has the burden of proof,
- (23) so if plaintiff gets to open for an hour and a half, we all get
- (24) through, Mr O'Neill can get back up at you and have one -
- (25) have the last word The last - boy, the last word is so

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- (1) I want you to know that I don't get to talk to you again
- (2) but if he says something, I want you to know that I'll be over
- (3) there fidgeting because if I had another word, I could answer
- (4) him
- (5) Thank you very much
- (6) THE COURT At this point I would ask everybody
- (7) please stay in place except the jury We'll take - we're
- (8) going to take our second recess now but there's something I
- (9) need to talk to the lawyers about before I do my instructions
- (10) We'll reconvene in about 20 minutes
- (11) (Jury out at 12:08 p.m.)
- (12) THE COURT Actually it turns out I have two things
- (13) Mr Daum we're going to need you up front at this point
- (14) First thing that I want to take up is the plaintiffs
- (15) request that I modify jury instruction number 36 Mr Daum,
- (16) have you had a chance to look at that proposal and do you have
- (17) anything to say about it?
- (18) MR DAUM May it please the Court Yes, we've looked
- (19) at it Your Honor We think their proposal is quite wrong and
- (20) confuses two completely different issues One is the level of
- (21) the employee who must act in order to bring the - in order for
- (22) his acts to be imputed to the corporation Protectus addresses
- (23) that question and says that that employee must be a managerial
- (24) employee rather than some other kind of employee
- (25) The second question to which instruction 36 is addressed is

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- (1) the effective corporate policies And whatever level of
 (2) employee you re talking about corporate policies may be taken
 (3) into account and at a certain point if enforced enough and
 (4) adequately and published and so forth do in fact prevent the
 (5) employee from acting within the course and scope of his
 (6) employment and therefore prevent imputation So the
 (7) plaintiffs' proposed instruction confuses two quite different
 (8) concepts
 (9) We think 36 is right and it's entirely consistent with 34
 (10) and 33 Your Honor knows our views on those instructions but
 (11) that s a different question So we do object to a change We
 (12) think it s untimely and we think it s wrong
 (13) THE COURT All right I - I am concerned that
 (14) without this change we have some risk of confusion What I
 (15) propose to do, so that you will know and not be surprised when
 (16) I read the instruction, what I am going to do is essentially
 (17) take the plaintiffs' proposed new instruction 36 but I m going
 (18) to change it just a little bit The proposal inserted the
 (19) words, unless the employee is a managerial agent I m not
 (20) going to stick that clause in but I am going to tie a new
 (21) paragraph onto instruction 36 that will say in substance
 (22) however if the employee was a management - a managerial
 (23) agent, then as stated in instruction 33, the acts et cetera
 (24) which was essentially your proposal So that change is going
 (25) to be made in the instruction

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- (1) MR OESTING Thank you Your Honor
 (2) THE COURT I will assume that Exxon takes exception
 (3) to that change for purposes of your exceptions
 (4) MR DAUM We do Your Honor I take it we're on the
 (5) record and that objection will also be deemed made after the
 (6) charge
 (7) MR O NEILL Right
 (8) THE COURT Yes we have an understanding on that
 (9) I also have a second matter that was just brought to my
 (10) attention I have a motion to lift the stay and a motion to
 (11) stay proceedings by Mr Lakosh asking that we do one or the
 (12) other of two things that would prevent him to take some action
 (13) with respect to certain breach-of contract claims that he is
 (14) asserting
 (15) I am not going to stay these proceedings at this time to
 (16) take up other claims We are going to proceed on the plan that
 (17) we started out on and we ll take up his individual contract
 (18) claims at another time
 (19) MR DAUM Your Honor I have merely a question The
 (20) draft instructions seem to contemplate that the jury will work
 (21) from nine to five while deliberating If that was your
 (22) intention we have no problem with it but I didn t know
 (23) whether you really intended to do that
 (24) THE COURT That s something - excuse me for
 (25) interrupting That's something that I have among several

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- (1) things that I meant to confer with you all on and perhaps we
 (2) had just as well take that one up right now rather than later
 (3) I m sort of two minds on this thing and I ll take your
 (4) collective additional thoughts on it Normally we have jurors
 (5) deliberate from nine until five This jury has been on an
 (6) eight to two schedule right through this and I m a little
 (7) concerned that some of them may have in substance
 committed
 (8) themselves to that kind of a drill on the assumption that it
 (9) will apply during deliberations also What I propose to do in
 (10) order to cut through that, is to suggest that the jury -
 (11) jurors themselves decide whether they want to do our
 (12) traditional nine to-five or whether they want to run eight to
 (13) two Does anyone have a problem with my giving them that
 (14) choice?
 (15) MR O'NEILL No, sir
 (16) MR SANDERS No
 (17) MR LYNCH No, sir, Your Honor
 (18) THE COURT Everyone seems to be in agreement I'll
 (19) read the instruction just as it is because it s easier to do it
 (20) that way When I get through with that, I will say but I'm
 (21) going to let you have a choice about this I ll let you decide
 (22) which way to do it Whatever happens it - we will inform
 (23) you what their decision is as soon as we find out what it is
 (24) MR O NEILL Thank you
 (25) THE COURT All right We'll take our second recess

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- (1) for 15 minutes at this point and then we ll finish up
 (2) (Recess)
 (3) (Jury in at 12 30)
 (4) MR O'NEILL Thank you Judge
 (5) THE COURT Mr O Neill
 (6) FINAL CLOSING BY MR O NEILL
 (7) MR O NEILL There is an old damage, and again, I
 (8) don t mean to be ageist when I say this, but there is an old
 (9) damage that s been around the courtroom since - as long as
 Mr
 (10) Neal has practiced law which means a long long time which
 (11) says If you have the facts argue the facts, if you have the
 (12) law argue the law, and if you don t have any law or any facts
 (13) argue the other lawyer But we heard that
 (14) I d like to play the tapes, the VTC tapes, because we do
 (15) have a witness We can be witnesses to what happened by
 (16) listening to the tapes as to what was recorded that evening
 (17) Let s play the audio tape of the VTC we ll listen to it for
 (18) five minutes
 (19) (Audio played- sometimes indiscernible)
 (20) EV Valdez traffic, Exxon Valdez
 (21) VTC Valdez traffic, go ahead
 (22) EV Departed the pilot or disembarked the pilot,
 (23) excuse me, and this time hooking up to sea speed and ETA
 Naked
 (24) Island 0100, over
 (25) VTC Roger that, sir Request an updated ice report

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- (1) when you get down through there over
- (2) EV Okay, I was just about to tell you that judging
- (3) by our radar, I will probably divert from the TSS and end up in
- (4) the inbound lane if there's no conflicting traffic over
- (5) VTC No reported traffic I've got the Chevron
- (6) California one hour out then the Arco Alaska is right behind
- (7) them but they're an hour out from Cape Hinchinbrook, out on
- (8) that, over
- (9) EV That would be fine, yeah We may end up over in
- (10) the inbound lane outbound transit We'll notify you when we
- (11) leave the TSS and cross over the separation zone over
- (12) VTC Roger that be waiting your call Traffic out
- (13) EV Exxon Valdez over, standing by 13 and 16
- (14) Valdez traffic, Exxon Valdez, W-H C-B over
- (15) VTC This is Valdez traffic, over
- (16) EV At the present time, I'm going to alter my course
- (17) to 200 and reduce speed to about 12 knots to wend my way
- (18) through the ice and, Naked Island ETA might be a little out of
- (19) whack but once we're clear of the ice out of Columbia Gla--
- (20) we'll give you another shout, over
- (21) Valdez traffic, Exxon Valdez, over
- (22) VTC Exxon Valdez, Valdez traffic
- (23) EV Yeah it's Valdez back We've -- should be on
- (24) your radar there, we've fetched up hard aground north of
- (25) Goose Island off Bligh Reef and evidently leaking some oil and we're

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- (1) going to be here for a while and if you want so you're
- (2) notified over
- (3) COTP Exxon Valdez, this is the captain of the port
- (4) on channel 13 over
- (5) EV Exxon Valdez back, over
- (6) COTP Exxon Valdez, this is the captain of the port
- (7) Commander McCall, good evening Do you have any more of
- (8) an estimate as to your situation at this time, over
- (9) EV Not at the present Steve Joe Hazelwood here
- (10) A little problem here with the third mate but we're working
- (11) our way off the reef We've -- the vessel's been holed and
- (12) we're ascertaining -- right now, we're trying to just to get
- (13) her off the reef and we'll get back to you as soon as we can,
- (14) over
- (15) COTP Roger on that Yeah, I've got you know --
- (16) we've got all our plan mechanisms in way to give you what
- (17) assistance we can You know, take it -- take it slow and easy
- (18) and you know I'm telling you the obvious, but you know take
- (19) it slow and easy and we're getting help out as fast as we can,
- (20) and I'd appreciate when you get around, if you can give me a
- (21) fairly good -- if you can give me an update whenever as to the
- (22) general location what you suspect it might be and of the
- (23) stability info over
- (24) EV Okay, we're pretty good shape right now
- (25) stability-wise we're just trying to extract her off the shoal

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- (1) here and you can probably see me on your radar and once we
- (2) get
- (3) underway I'll let you know do another damage control
- (4) assessment over
- (5) COTP Roger yeah And let me know -- again before
- (6) you make any drastic attempt to get underway, you make sure
- (7) you
- (8) don't you know, start doing any ripping You got a rising
- (9) tide you got about another -- about an hour and a half worth
- (10) of tide in your favor Once you hit that max, I wouldn't
- (11) recommend doing much wiggling, over
- (12) EV Okay, yeah, I think it's -- major damage has kind
- (13) of been done We kind of rock and rolled over it and we're
- (14) just kind of hung up in the stern here We're just -- we'll
- (15) drift over it I'll get back to you We'll be standing by 13
- (16) 16 Exxon Valdez clear
- (17) (End of audio tape)
- (18) MR O NEILL We know two things We know the
- (19) afternoon of the 23rd he drank in town and he admits to those
- (20) occasions where he was drinking with Glowacki and Roberson
- (21) And he minimizes his drinking and he minimized his drinking to
- (22) the Coast Guard, but he was in and out of bars, and we brought
- (23) the bartenders here by videotape to testify
- (24) So we know before those tapes he was drinking And we know
- (25) that the next day he tested 06 for alcohol on a blood alcohol
- (26) test He drank the afternoon we listened to the tapes, and he
- (27) tested 06

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- (1) Now let's discuss, if we could for a minute, the blood
- (2) test Did Dr Peat, his wife the United States Justice
- (3) Department, Scott Conner, the lieutenant in Anchorage and
- (4) others as yet unknown get together, have a meeting and decide
- (5) to sneak into the cooler down at the Coast Guard station in
- (6) Valdez? It's preposterous It's absolutely preposterous
- (7) This is the sample It's got stickers on it, initials on
- (8) it the top on it no -- nobody's come in here and said
- (9) anything happened to this thing other than the box was opened
- (10) Dr Smith came in and testified that the important thing was
- (11) the integrity of the sample There's been no proof that
- (12) anybody had any motive, any access, any intention to sneak in
- (13) there, Hey, I got a great idea let's get Erma Lee, Janice
- (14) Delozier, the Coast Guard, the Justice Department of the United
- (15) States -- let's all get together and let's see if we can make
- (16) up a test tube that looks like that and then sneak it in It
- (17) is absolutely preposterous It is a lawyer's argument
- (18) The Coast Guard under the circumstances that they had did
- (19) a good job Now, I want to address one other thing about this
- (20) blood alcohol issue
- (21) Did the test tubes have a preservative in them or not
- (22) okay? Were they ten milliliter test tubes or not? I put this
- (23) up quickly before but let's put it up for a minute This is
- (24) the -- the actual form that was taken out of the Exxon Valdez
- (25) kit and as you can see it has all of the signatures and

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- (1) everything on the bottom but what does it describe? Two
 (2) sterile ten milliliter Vacutainer brand tubes each containing
 (3) 20 milligrams of sodium fluoride and ten milligrams of disodium
 (4) edistate Those are the chemicals that are in gray stoppered
 (5) tubes
 (6) So they take young Conner's confusion over the size of the
 (7) tubes - we now know they're ten milliliter tubes - and they
 (8) take the fact that because of the evidence tape over the top
 (9) they were logged in wrong, both understandable
 happenstances
 (10) and then we get this long elaborate fairy tale about the
 (11) justice department, the United States Coast Guard, and who
 (12) knows what else about the 06 blood samples Which is in
 (13) polite terms, hogwash
 (14) And Dr Smith if you'll recall computed for us what his
 (15) blood-alcohol level would be at midnight and it's 241
 (16) Typical for someone who is intoxicated
 (17) Now, I want to put that together with one other piece
 (18) uncontradicted piece of testimony Exxon's Dr Mendelson said
 (19) that alcoholics can operate physically without showing signs of
 (20) impairment from 2 to 4 And we got that out of his book his
 (21) physical book
 (22) So we know he drank the afternoon He was seen by three
 (23) bartenders - or two bartenders and a patron - and his
 (24) companions and they were drinking big drinks We know he
 (25) tested .06 the next morning, and we can hear his speech Now

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- (1) you can play all the lawyers' games you want but you can't
 (2) change that
 (3) Now, just so we remember Dr Smith also testified about
 (4) how alcoholics can function between 2 and 4 if you recall
 (5) him drawing this, but judgment goes first Judgment goes first
 (6) and motor skills go second
 (7) Now I want to talk a little bit about the diagnosis Talk
 (8) about what we can't change All the lawyers' arguments
 (9) notwithstanding, what can't we change? The testimony of his
 (10) treating physician
 (11) So it was your view then that Captain Hazelwood should
 (12) remain alcohol-free for the rest of his life on discharge?
 (13) Yes
 (14) And we can't change what is in the DSM with regard to what
 (15) alcohol abuse is The need for the daily use of alcohol for
 (16) adequate functioning, the inability to cut down or stop
 (17) drinking, repeated efforts to go on the wagon, binges,
 (18) occasional consumption of a fifth of spirits or its equivalent
 (19) in wine or beer amnesia continuation of drinking despite
 (20) serious physical disorder drinking of non beverage alcohol -
 (21) serious things
 (22) Dr Vallury his treating physician said he can't drink
 (23) again - That was the prescription
 (24) There is no evidence that these three people from Valdez
 (25) Alaska decided to get together and lie about something that

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- (1) they had no interest lying in lying about They saw him going
 (2) in and out of the bar and from 2:15 to four where was he? He
 (3) said he was in his Coast Guard interview over at the Pipeline
 (4) Club at three He was drinking all afternoon Who knows how
 (5) much but he tested .06
 (6) His actions during the voyage, there were a variety of
 (7) actions during the voyage that may not have caused the
 (8) grounding, but are evidence that something was seriously
 (9) wrong,
 (10) and let's go through a couple of those
 (11) He leaves the bridge when they're going through the
 (12) Narrows Didn't cause the accident but is not a good
 (13) practice Why? Tired and woozy from drinking all afternoon
 (14) He reports to the VTC that he was reducing vessel speed but
 (15) he
 (16) wasn't reducing vessel speed Why? He leaves the bridge
 (17) Why?
 (18) Now, after the grounding, when he phones in he says we're
 (19) at Goose Island Now, he's only been off the bridge ten or
 (20) eleven minutes Goose Island is more than an hour and a half
 (21) away from there Why? Because he's impaired by alcohol His
 (22) cognitive functions are impaired by alcohol
 (23) Thank you
 (24) Now I want to talk - I agree totally with Mr Sanders
 (25) board I think this is a very good exhibit I think this is a
 wonderful exhibit This is what happened no doubt about it
 (25) And what I find most interesting is the top entry Hazelwood

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- (1) leaves the bridge And then this confusion or chaos reigns
 (2) Now Cousins says he called him when he started the turn
 (3) Greg Cousins does say that Which puts it down here
 (4) Hazelwood wants to say that he called up here or up here
 (5) because it takes him off the hook But when Cousins said the
 (6) call was about the turn it comes down here
 (7) Now the other interesting thing about this is, what
 (8) happens for these five or six minutes? He Z's out
 (9) And what is the easiest explanation? There's a logical
 (10) principle called Ockham's Razor that says, when faced with a
 (11) bunch of circumstances the easiest explanation gives you
 (12) more
 (13) often than not, the right answer
 (14) What is the most logical explanation for Greg Cousins Z'ing
 (15) out on the bridge? Fatigue
 (16) But in any event, if the good captain would have been here
 (17) as he was supposed to none of this would have happened So
 (18) his not being on the bridge was a legal cause
 (19) Now these policies that they talk about being so great
 (20) aren't so great And the law in effect in 1985 didn't require
 (21) this kind of stupidity The ordinary person faced with this
 (22) policy or prospect or statement would say That is one of the
 (23) stupidest things I've ever heard in my life And it is And
 (24) the law doesn't require it
 (25) And let's take - I don't want to - the Rehabilitation Act
 of 1973 which was in effect - and you'll get this jury

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- (1) instruction which says if on the other hand an employee's
- (2) current use of alcohol prevents the employee from performing
- (3) the duties of the employee's job or if because of the
- (4) employee's current use continued employment constitutes a
- (5) direct threat to the property or safety - and when Neal read
- (6) this the first time, he left out or safety of others then
- (7) the employee is not covered by the act Either one
- (8) Now I would submit to you that in a safety sensitive
- (9) position the fact that somebody is drinking again - and
- (10) you're only going to find out about his relapse at the time of
- (11) the accident is covered by the first half of this but more
- (12) importantly after all the testimony we have heard about what a
- (13) critical job this is, the current use of alcohol by a
- (14) supertanker captain presents a direct threat to the safety of
- (15) others and the law does not protect it
- (16) And to say it does and to say that this is what the law
- (17) requires means that Exxon Corporation has not learned its
- (18) lesson
- (19) And the fact that they have some policies - and I told you
- (20) at the beginning they'd have policies - isn't enough to get
- (21) them off of the hook In this case their policies are the
- (22) problem You know, the policies that allow this kind of risk
- (23) to the public are the problem, but if they had good policies,
- (24) that doesn't even take them off of the hook because they have
- (25) to take diligent measures to enforce the policy

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- (1) For example if you have a tanker captain that is drinking,
- (2) you do something about it
- (3) We don't need to say any more about the Coast Guard because
- (4) we watched Mr Rawls testify before the Congress but in the
- (5) manual, as we've gone over it's Exxon and the vessel master's
- (6) responsibility and it isn't the Coast Guard's responsibility
- (7) And as to whether his leaving the bridge was a cause or not
- (8) logic you know give me a break He's supposed to be on the
- (9) bridge, four eyes instead of two, remember that? And these
- (10) kinds of waters the - the reason we have two people on the
- (11) bridge is to make sure one catches the error of the other
- (12) That's the only reason It isn't done so that everybody can
- (13) have a job It isn't done for fun it isn't done because one
- (14) guy wants to do sight seeing when the other guy is not there
- (15) It's to have two people on the bridge, four eyes instead of
- (16) two
- (17) And Exxon concedes in fact it stipulates that his leaving
- (18) the bridge was a proximate cause of the spill And to say at
- (19) this point that it wasn't and that it was poor Greg Cousins
- (20) fault is to play games in this arena with you
- (21) And with regard to self identification that's also a big
- (22) game Exxon has stipulated in the course of this proceeding
- (23) that his conduct that the Graves report detailed such conduct
- (24) constituted a clear violation of Exxon Shipping Company's
- (25) prohibitions against the use of alcohol or intoxication aboard

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- (1) Exxon vessels They could have fired him
- (2) Now you get this heart-rendering story of anguish over the
- (3) decision by Frank Iarossi I want you to remember that Iarossi
- (4) was not told about this until two weeks after the decision was
- (5) made And then Iarossi and Mr Graves have very, very
- (6) different versions as to what was said And you want a motive
- (7) for all of this? You want a motive? This company doesn't give
- (8) a damn
- (9) It isn't that they're trying to be mean It isn't that
- (10) they're trying to run a vessel on a rock It's that they are
- (11) indifferent to the rights and safety of others That from 1985
- (12) or before until 1989, they didn't care whether they had
- (13) alcoholic captains, drinking captains, drinking on board
- (14) vessels, so long as they could cover their tails with
- (15) policies
- (16) And we see that They don't do anything to Hazelwood, they
- (17) never talk to Hazelwood It was all the argument in the - and
- (18) the evidence over a hundred witnesses did we have somebody
- (19) come in and say I called Joe in, I sat down and I asked
- (20) Joe, How is your drinking, how is your recovery, how is your
- (21) AA, how is your family, how is any of that? "
- (22) Did one person do that? Where is it?
- (23) I mean isn't that how we treat each other? They didn't do
- (24) the man any favor He is in the history books now They
- (25) didn't do him any favor He is now in the history books as the

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- (1) captain who left the bridge prior to one of the great maritime
- (2) accidents in the history of the world They did this man a
- (3) favor by not being - by not being decent to him? They did
- (4) this man a favor by not treating him the same way that we
- (5) expect to be treated? They didn't do him any favors
- (6) And I want to mention one more thing Could I have the
- (7) Elmo please?
- (8) This is the agreement between Exxon and Captain Hazelwood
- (9) The parties agree that neither shall use in any manner
- (10) deposition or trial testimony or any evidence derived therefrom
- (11) given by either party in the Valdez litigation in connection
- (12) with the mediation or arbitration provided for herein
- (13) That's what that says That means that each one of them
- (14) can come in here and say what they want to say and they can't
- (15) use it in the fight between them
- (16) Now why would anybody agree to that? So that they can
- (17) come in here and tell whatever story they want to tell
- (18) Exxon Corporation is so big, so powerful has had its way
- (19) for over a hundred years, that it thinks it can do whatever it
- (20) wants to do in and out of the courtroom, today, 1985 1989, and
- (21) Ladies and Gentlemen of the Jury, you are the only people that
- (22) can stop that Thank you
- (23) JURY INSTRUCTIONS
- (24) THE COURT Members of the Jury We have now
- (25) completed phase one of this trial Now that you have heard the

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- (1) evidence and the arguments it becomes my duty to give you the
- (2) instructions as to the law applicable to this part of this
- (3) case
- (4) Two copies of these instructions will be available for you
- (5) in the jury room for further review I urge you to review
- (6) these instructions from time to time as you progress with your
- (7) deliberations
- (8) It is your duty as jurors to follow the law as stated in
- (9) these instructions as to apply that law to the facts as you
- (10) find them from the evidence in this case You are not to
- (11) single out one instruction alone as stating the law but must
- (12) consider the instructions as a whole Neither are you to be
- (13) concerned with the wisdom of any rule of law stated by the
- (14) Court Regardless of any opinion you may have as to what the
- (15) law ought to be, it would be a violation of your sworn duty to
- (16) base a verdict upon any other view of the law than that given
- (17) in the instructions of the Court
- (18) Similarly it would be a violation of your sworn duty as
- (19) judges of the facts to base a verdict upon anything but the
- (20) evidence in the case presented here in open court Nothing I
- (21) say in these instructions is to be taken as an indication that
- (22) I have an opinion as to the facts of the case or what that
- (23) opinion is It is not my function to determine the facts but
- (24) rather yours
- (25) Justice through trial by jury must always depend upon the

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- (1) willingness of each individual juror to seek the truth as to
- (2) the facts only from the same evidence presented to all the
- (3) jurors and to arrive at a verdict by applying the same rules of
- (4) law as given in the instructions of the Court
- (5) You have been chosen and sworn as jurors in this case to
- (6) try the issues of fact presented by the plaintiffs and the
- (7) defendants You are to perform this duty without bias or
- (8) prejudice as to any party Our system of law does not permit
- (9) jurors to be governed by sympathy prejudice or public opinion
- (10) as to either party The law requires, and both parties and the
- (11) public expect that you will carefully and impartially consider
- (12) all the evidence in the case follow the law as stated by the
- (13) Court and reach a just verdict regardless of the
- (14) consequences
- (15) Unless otherwise stated the jury should consider each
- (16) instruction given to apply to all the plaintiffs and to all the
- (17) defendants in the case
- (18) This case should be considered and decided by you as an
- (19) action between persons of equal standing in the same
- (20) community
- (21) of equal worth and holding the same or similar stations in
- (22) life In your decisions on the issues of fact a corporation
- (23) is entitled to the same fair trial at your hands as a private
- (24) individual All persons including corporations partnerships
- (25) unincorporated associations and other organizations stand

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- (1) jury as equals in a court of justice
- (2) For purposes of this trial the parties will refer to Exxon
- (3) Shipping Company and Exxon Corporation as the Exxon
- (4) defendants
- (5) and you should consider all evidence arguments and
- (6) questions
- (7) submitted to you for decision as though the Exxon defendants
- (8) were one party
- (9) An act or failure to act of Exxon Shipping Company or any
- (10) knowledge or information known or available to Exxon Shipping
- (11) Company shall be considered to be equally the act or
- (12) knowledge
- (13) of Exxon Corporation Any act or failure to act by Exxon
- (14) Corporation or any knowledge or information known or
- (15) available
- (16) to Exxon Corporation shall be considered the act or failure to
- (17) act of or the knowledge of Exxon Shipping Company
- (18) There are many parties and many lawyers in this lawsuit
- (19) Early in this litigation, I asked the lawyers for the parties
- (20) who are generally on the same side to work together as much
- (21) as
- (22) possible so as to reduce expenses for everyone and to reduce
- (23) the burden on my staff and the Court system I asked counsel
- (24) for the plaintiffs to work together and I asked counsel for
- (25) defendants to work together All counsel have done what I
- (26) asked Accordingly you should draw no inference for or
- (27) against any party as a result of the fact that their counsel
- (28) have worked closely together with counsel for other parties
- (29) In doing that, they were doing what I asked them to do
- (30) There are, generally speaking two types of evidence from

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- (1) which a jury may properly find the truth as to the facts of the
- (2) case One is direct evidence such as the testimony of an
- (3) eyewitness The other is indirect or circumstantial evidence
- (4) The proof of a chain of circumstances pointing to the existence
- (5) or nonexistence of certain facts As a general rule the law
- (6) makes no distinction between direct or circumstantial evidence
- (7) but simply requires that the jury find the facts in accordance
- (8) with the preponderance of all the evidence in the case both
- (9) direct and circumstantial
- (10) The evidence from which you are to decide what the facts
- (11) are consist of, one the sworn testimony of witnesses both on
- (12) direct and cross-examination, regardless of who called the
- (13) witness, two, the exhibits which have been received into
- (14) evidence, and, three, any facts to which all the lawyers have
- (15) agreed or stipulated
- (16) Plaintiffs and the defendants have agreed or stipulated to
- (17) certain facts You should treat those facts as having been
- (18) proved
- (19) Certain things are not evidence and you may not consider
- (20) these things except insofar as they are supported by the
- (21) evidence These things include, one, arguments and
- (22) statements
- (23) by lawyers are not evidence the lawyers are not witnesses
- (24) What they say in their opening statements closing arguments
- (25) and at other times is intended to help you interpret the
- (26) evidence, but it is not evidence If the facts as you remember

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- (1) them differ from the way the lawyers have stated them your
- (2) memory of them controls
- (3) Two objections by lawyers are not evidence Attorneys
- (4) have a duty to their clients to object when they believe a
- (5) question is improper under the rules of evidence You should
- (6) not be influenced by the objection or by the Court a ruling on
- (7) it
- (8) Three, testimony that has been excluded or stricken or that
- (9) you've been instructed to disregard is not evidence and must
- (10) not be considered
- (11) Four evidence admitted for a limited purpose is not
- (12) evidence for any other purpose Thus when I have admitted
- (13) some
- (14) evidence for a limited purpose it would be improper to
- (15) consider that evidence for any other purpose
- (16) Five, anything you may have seen or heard when the Court
- (17) was not in session is not evidence You are to decide the case
- (18) solely on the evidence received during trial
- (19) Six, some of you have taken notes during the trial Such
- (20) notes are not evidence and are only for the personal use of the
- (21) person who took them
- (22) Certain charts and summaries have been shown to you in
- (23) order to help explain the facts disclosed by the books records
- (24) and other documents which are in evidence in the case
- (25) However such charts or summaries are not in and of themselves
- (26) evidence or proof of any facts If such charts or summaries do

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- (1) not correctly reflect facts or figures shown by the evidence in
- (2) the case you should disregard them In other words such
- (3) charts or summaries are used only as a matter of convenience
- (4) so if and to the extent that you find they are not in truth
- (5) summaries of facts or figures shown by the evidence in the
- (6) case you are to disregard them entirely
- (7) You are to consider only the evidence in the case, but in
- (8) your consideration of the evidence you are not limited to the
- (9) bald statements of the witnesses In other words you are not
- (10) limited solely to what you see and hear as the witnesses
- (11) testify or what appears on the face of exhibits You are
- (12) permitted to draw on facts which you find have been proved by
- (13) the evidence in this face of the trial such reasonable
- (14) inferences as seem justified in the light of your experience
- (15) Inferences are deductions or conclusions which reason and
- (16) common sense lead the jury to draw from the facts which have
- (17) been established by the evidence in the case
- (18) You are not bound to decide any issue of fact in accordance
- (19) with the testimony of any number of witnesses which does not
- (20) produce in your minds belief in the likelihood of truth as
- (21) against the testimony of a lesser number of witnesses or other
- (22) evidence which does not produce such belief in your minds The
- (23) test is not which side brings the greater number of witnesses
- (24) or presents the greater quantity of evidence but which witness
- (25) and which evidence appeals to your minds as being most
- (26) accurate

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- (1) and otherwise trustworthy
- (2) The testimony of a single witness who produces in your
- (3) minds belief in the likelihood of truth is sufficient for the
- (4) proof of any fact and would justify a verdict in accordance
- (5) with such testimony, even though a number of witnesses may
- (6) have
- (7) testified to the contrary, if after consideration of all the
- (8) evidence in the case you hold greater belief in the accuracy
- (9) and reliability of the one witness
- (10) During this part of the trial, certain depositions were
- (11) read or played to you These consist of sworn, recorded
- (12) answers to questions asked of the witness in advance of the
- (13) trial by one or more of the attorneys for the parties to the
- (14) case Such testimony is entitled to the same consideration and
- (15) is to be judged as to credibility and weighed and otherwise
- (16) considered by the jury insofar as possible in the same way as
- (17) if the witness had been present and had testified from the
- (18) witness stand
- (19) The rules of evidence ordinarily do not permit witnesses to
- (20) testify as to opinions or conclusions An exception to this
- (21) rule exists for those whom we call expert witnesses Witnesses
- (22) who by education or experience have become expert in some
- (23) art,
- (24) science, profession or calling, may state their opinions as to
- (25) relevant and material matters in which they profess to be
- (26) expert and may also state their reasons for the opinion
- (27) You should consider each expert opinion received in

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- (1) evidence in this case and give it such weight as you think it
- (2) deserves If you should decide that the opinion of an expert
- (3) witness is not based upon sufficient education and experience
- (4) or if you should conclude that the reasons given in support of
- (5) the opinion are not sound or if you feel that it is outweighed
- (6) by other evidence, you may disregard the opinion entirely
- (7) The burden is on the plaintiffs in a civil action such as
- (8) this to prove every essential element of their claims by a
- (9) preponderance of the evidence If the proof should fail to
- (10) establish any essential element of a claim by a preponderance
- (11) of the evidence in the case the jury should find for the
- (12) defendant as to that claim
- (13) To, quote establish by a preponderance of the evidence,
- (14) end quote, means to prove that something is more likely so than
- (15) not so In other words, a preponderance of the evidence in the
- (16) case means such evidence as, when considered and compared
- (17) with
- (18) that opposed to it, has more convincing force and produces in
- (19) your minds belief that what is sought to be proved is more
- (20) likely true than not true
- (21) This rule does not of course, require proof to an absolute
- (22) certainty, since proof to an absolute certainty is seldom
- (23) possible in any case
- (24) In determining whether any fact in issue has been proved by
- (25) a preponderance of the evidence in the case the jury may
- (26) unless otherwise instructed consider the testimony of all

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- (1) witnesses regardless of who may have called them and all
- (2) exhibits received in evidence regardless of who may have
- (3) produced them
- (4) When I say in these instructions that the party has the
- (5) burden of proof on any proposition or use the expression
- (6) quote if you find end quote, or quote, if you side end
- (7) quote I mean you must be persuaded considering all the
- (8) evidence
- (9) in the case that the proposition is more probably true than not
- (10) true
- (11) In deciding whether plaintiffs have proved a fact or an
- (12) element of a claim by a preponderance of the evidence you
- (13) must
- (14) evaluate all the evidence in doing this you must decide which
- (15) testimony to believe and which testimony not to believe You
- (16) may believe all or any part or none of any witness testimony
- (17) In making that decision, you may take into account a number of
- (18) factors including the following
- (19) One Was the witness able to see or hear or know the things
- (20) about which that witness testified,
- (21) Two, How well was the witness able to recall and describe
- (22) those things,
- (23) Three What was the witness manner while testifying
- (24) Four, Did the witness have an interest in the outcome of
- (25) this case or any bias or prejudice concerning any party or any
- (26) matter involved in the case,
- (27) Five How reasonable was the witness testimony considered

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- (1) in the light of all of the evidence in the case
- (2) Six Was the witness testimony contradicted by what that
- (3) witness has said or done at another time or by the testimony of
- (4) other witnesses or by other evidence
- (5) In deciding whether or not to believe a witness keep in
- (6) mind that people sometimes forget things You need to
- (7) consider therefore whether a contradiction is an innocent
- (8) lapse of memory or an intentional falsehood And that may
- (9) depend on whether it has to do with an important fact or with
- (10) only a small detail
- (11) A witness may be discredited or impeached by contradictory
- (12) evidence or by evidence that at some other time the witness has
- (13) said or thing something or has failed to say or do something
- (14) which is inconsistent with the witness' present testimony If
- (15) you believe any witness has been impeached and thus
- (16) discredited it is your exclusive province to give the
- (17) testimony of that witness such credibility if any as you may
- (18) think it deserves
- (19) If a witness is shown knowingly to have testified falsely
- (20) concerning any material matter, you have a right to distrust
- (21) such witness testimony in other particulars and you may
- (22) reject all the testimony of that witness or give it such
- (23) credibility as you may think it deserves
- (24) Plaintiffs claim the defendant Hazelwood negligently caused
- (25) the grounding of the Exxon Valdez on March 24, 1989 The

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- (1) burden is on the plaintiffs to establish by a preponderance of
- (2) the evidence in the case the essential elements of a cause of
- (3) action for negligence These elements are first that
- (4) defendant Hazelwood was negligent and second that
- (5) defendant
- (6) Hazelwood's negligence was a legal cause of the grounding of
- (7) the Exxon Valdez
- (8) Negligence is the failure to use reasonable care
- (9) Reasonable care is that amount of care that a reasonably
- (10) prudent person would use under similar circumstances
- (11) Negligence may consist of doing something which a reasonably
- (12) prudent person would not do or it may consist of failing to do
- (13) something which a reasonably prudent person would do A
- (14) reasonably prudent person is not the exceptionally cautious or
- (15) skillful individual, but a person of reasonable and ordinary
- (16) carefulness
- (17) In this case you must decide whether defendant Hazelwood
- (18) used reasonable care under the circumstances
- (19) I will now define the meaning of legal cause A legal
- (20) cause of an occurrence is an act or failure to act which is a
- (21) substantial factor in bringing about the occurrence In order
- (22) to determine that particular conduct was a substantial factor
- (23) in bringing about the grounding of the Exxon Valdez you must
- (24) find by a preponderance of the evidence that it was more likely
- (25) true than not true that, one, the grounding would not have
- (26) occurred but for that conduct, and two, the conduct was so

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- (1) important in bringing about the grounding that a reasonable
- (2) person would regard it as a cause and attach responsibility to
- (3) it
- (4) This does not mean that the law recognizes only one legal
- (5) cause of an occurrence consisting of only one factor or thing
- (6) or the conduct of only one person On the contrary many
- (7) factors or things or the conduct of two or more persons may
- (8) operate at the same time either independently or together to
- (9) cause an occurrence And in such a case each may be a legal
- (10) cause
- (11) If you find by a preponderance of the evidence in the case
- (12) that Captain Hazelwood by some act or failure to act violated
- (13) the provisions of a statute or regulation such conduct in
- (14) violation of the law is presumed negligent
- (15) In this case, plaintiffs allege violations of several
- (16) provisions of federal law The so-called six-hour rule is a
- (17) federal law which provides that the owner or master of a vessel
- (18) may permit an officer to take charge of the deck watch on a
- (19) vessel when leaving or immediately after leaving port only if
- (20) the officer has been off duty for at least six hours within the
- (21) 12 hours immediately before the time of leaving
- (22) The so called four hour rule is a federal regulation which
- (23) provides that a master or crew member of a vessel shall not
- (24) perform or attempt to perform any scheduled duties within four
- (25) hours of consuming any alcohol

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- (1) The so-called pilotage requirement is a federal statute
- (2) that requires unless waived by the Coast Guard, that a person
- (3) licensed by the Coast Guard as a pilot be in command of vessels
- (4) between Rocky Point and Cape Hinchinbrook
- (5) The presumption of negligence arising from violation of law
- (6) is not conclusive but may be overcome or outweighed by evidence
- (7) in the case which satisfies your minds that, notwithstanding
- (8) any failure to comply with the provisions of the statute or
- (9) regulation in question Captain Hazelwood acted as a reasonably
- (10) prudent person would have acted under all the surrounding
- (11) circumstances shown by the evidence in the case
- (12) And you must bear in mind that a finding of negligence
- (13) which is based upon a violation of a statute or regulation will
- (14) not justify a verdict against Captain Hazelwood unless the
- (15) violation of the law was a legal cause of the grounding of the
- (16) Exxon Valdez
- (17) Some of the foregoing matters are amplified in some
- (18) additional specific instructions applicable to all of
- (19) plaintiffs claims are to be found in instructions 37 through
- (20) number 45 which I have not read yet
- (21) For purposes of this litigation the Exxon defendants have
- (22) stipulated that Captain Hazelwood was negligent in leaving the
- (23) bridge of the Exxon Valdez at 11 53 p m on the night of the
- (24) grounding This stipulation is binding only as to the Exxon
- (25) defendants Captain Hazelwood disputes that he was negligent

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- (1) in leaving the bridge Therefore in considering any of the
- (2) plaintiffs claims against Captain Hazelwood you must entirely
- (3) disregard the Exxon defendants stipulation
- (4) Plaintiffs claim that the conduct of the Exxon defendants
- (5) and Captain Hazelwood was such as to render them liable for
- (6) punitive damages In this phase of the trial you are asked to
- (7) determine whether defendants conduct was such that punitive
- (8) damages may be awarded If you find that the defendants
- (9) conduct was such that punitive damages may be awarded you
- (10) will
- (11) be asked in a subsequent phase of the case to determine the
- (12) amount if any of punitive damages that should be awarded
- (13) There will be a phase two of this trial in which you will
- (14) be asked to determine the amount of damages if any
- (15) necessary
- (16) to compensate the plaintiffs for any actual injuries which they
- (17) may have sustained as a result of the grounding of the Exxon
- (18) Valdez
- (19) Punitive damages are not favored in the law and are never
- (20) awarded as a right, no matter how egregious a defendant's
- (21) conduct but may be imposed for conduct that manifests
- (22) reckless
- (23) or callous disregard for the rights of others Punitive
- (24) damages serve the purpose of punishing a defendant of
- (25) teaching
- (26) a defendant not to do it again and of deterring others from
- (27) repeating harmful conduct Punitive damages are not awarded
- (28) for the purpose of compensating a plaintiff for injury
- (29) Punitive damages are in addition to all damages the law awards

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- (1) to compensate plaintiffs for injuries they have suffered
- (2) The burden is on the plaintiffs to establish by a
- (3) preponderance of the evidence in the case the essential
- (4) elements of their claims for punitive damages In this case,
- (5) the essential elements are, first that a defendant's conduct
- (6) before the grounding of the Exxon Valdez manifested reckless
- (7) or
- (8) callous disregard for the rights of others, and second, that
- (9) such conduct by a defendant was a legal cause of the
- (10) grounding
- (11) of the Exxon Valdez
- (12) In order for conduct to be considered reckless or callous
- (13) disregard for others, four factors must be present
- (14) First, a defendant must be subjectively conscious of a
- (15) particular grave danger or risk of harm and the danger or risk
- (16) must be a foreseeable and probable effect of the conduct
- (17) Second, the particular danger or risk of which the
- (18) defendant was subjectively conscious must in fact have
- (19) eventuated,
- (20) Third, a defendant must have disregarded the risk in
- (21) determining how to act
- (22) Fourth a defendant's conduct in ignoring the danger or
- (23) risk must have involved a gross deviation from the level of
- (24) care which an ordinary person would use having due regard to
- (25) all the circumstances
- (26) Reckless conduct is not the same as negligence Negligence
- (27) is the failure to use such care as a reasonable prudent and

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- (1) careful person would use under similar circumstances
- (2) **Reckless**
- (3) conduct differs from negligence in that it requires a conscious
- (4) choice of action either with knowledge of serious danger to
- (5) others or with knowledge of facts which would disclose the
- (6) danger to any reasonable person
- (7) A legal cause of an occurrence is an act or failure to act
- (8) which is a substantial factor in bringing about the
- (9) occurrence In order to determine whether particular reckless
- (10) conduct was a legal cause of the grounding of the Exxon
- (11) Valdez
- (12) you must find by a preponderance of the evidence that, one, the
- (13) grounding would not have occurred but for that conduct, and,
- (14) two that the conduct was so important in bringing about the
- (15) grounding that a reasonable person would regard it as a cause
- (16) and attach responsibility to it
- (17) This does not mean that the law recognizes only one legal
- (18) cause of an occurrence consisting of only one factor or thing
- (19) or the conduct of only one person In the contrary, many
- (20) factors or many things or the conduct of two or more persons
- (21) may operate at the same time either independently or together,
- (22) to cause an occurrence and, in such a case, each may be a
- (23) legal
- (24) cause
- (25) You must consider the conduct of each of the defendants –
- (26) Captain Hazelwood on the one hand and the Exxon defendants
- (27) on
- (28) the other hand – separately Unless you find by a
- (29) preponderance of the evidence that the conduct of a particular

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(1) defendant was reckless and that that conduct was the legal
 (2) cause of the grounding of the Exxon Valdez, your verdict should
 (3) be for that defendant and against the plaintiffs
 (4) If you find by a preponderance of the evidence that the
 (5) conduct of a particular defendant was reckless and was a legal
 (6) cause of the grounding your verdict should be for the
 (7) plaintiffs as to their claims against that defendant
 (8) Whether the United States Coast Guard does or does not have
 (9) any responsibility in this matter is not an issue in this
 (10) case You are to focus on the rights and responsibilities as
 (11) between the plaintiffs and the defendants Nevertheless I
 (12) have allowed evidence about the Coast Guard and the Vessel
 (13) Traffic System operated by the Coast Guard to be presented to
 (14) you In evaluating whether the defendants acted recklessly,
 (15) you may take into account all the information available to the
 (16) defendants at the time they acted including any understanding
 (17) or belief that they may have had with respect to the Coast
 (18) Guard's monitoring of vessel traffic
 (19) The Exxon defendants are corporations and certain rules –
 (20) and certain legal rules which it will be your duty to apply
 (21) affect the liability of corporations The Exxon defendants as
 (22) corporations may act only through natural persons and
 (23) especially through their officers and employees A corporation
 (24) is not responsible for the reckless acts of all of its
 (25) employees A corporation is responsible for the reckless act

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(1) of those employees who are employed in a managerial capacity
 (2) while acting in the scope of their employment The reckless
 (3) act or omission of a managerial officer or employee of a
 (4) corporation in the course and scope of the performance of his
 (5) duties is held in law to be the reckless act or omission of a
 (6) corporation
 (7) An employee of a corporation is employed in a managerial
 (8) capacity if the employee – the employee supervises other
 (9) employees and has responsibility for and authority over a
 (10) particular aspect of the corporation's business
 (11) In order for a corporation to be charged with subjective
 (12) knowledge of the consequences of a reckless act or omission of
 (13) one of its employees it must be shown that the persons who
 (14) engaged in such actions on behalf of the Exxon defendants
 (15) were
 (16) actually aware of the facts that indicated the highly dangerous
 (17) nature of the conduct Mere opportunity to learn facts is not
 (18) sufficient even if it was negligent not to learn about the
 (19) existence of such facts
 (20) To establish a basis for a finding of reckless conduct, it
 (21) must be shown that any failure to learn the facts was in
 (22) itself reckless
 (23) Since plaintiffs in this case seek punitive damages against
 (24) corporations you must consider whether the actions of the
 (25) employees were in violation of direct instructions or policies
 of the defendant corporations Merely stating or publishing

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(1) instructions or policies without taking diligent measures to
 (2) enforce them is not enough to excuse the employer for reckless
 (3) actions of the employee that are contrary to the employer's
 (4) policy or instructions
 (5) It is a question of fact whether a corporation has taken
 (6) adequate measures to enforce corporate policy in a given area
 (7) If you find that adequate measures were taken to establish and
 (8) enforce the policies or directions then an employee's acts
 (9) contrary to such policies or instructions are not attributable
 (10) to the employer and you should find that the employer's
 (11) conduct
 (12) was not reckless
 (13) However if the employee was a managerial agent then as
 (14) stated in instruction number 33 the acts of the employee are
 (15) attributable to the employer, whether or not those acts are
 (16) contrary to the employer's policy or instructions
 (17) I will now instruct you on – I will now instruct you as to
 (18) some specific matters that are relevant to plaintiffs' claims
 (19) that the actions of defendants involved reckless conduct or
 (20) that Captain Hazelwood's conduct involved negligence
 (21) You have heard certain evidence with respect to Captain
 (22) Hazelwood's activities following the grounding of the Exxon
 (23) Valdez You may not find that any conduct after the grounding
 (24) constituted reckless conduct by any defendant or negligence
 (25) by
 Captain Hazelwood But you may consider this evidence as to
 the issue of whether Captain Hazelwood was impaired by alcohol

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(1) at the time of the grounding
 (2) At the time of the grounding, federal law required that a
 (3) person licensed by the Coast Guard as a pilot be in command
 (4) of
 (5) vessels between Rocky Point and Cape Hinchinbrook Also at
 (6) that time, federal law provided that pilotage requirements
 (7) could be waived or modified by the United States Coast Guard
 (8) There is in this case evidence which you may evaluate
 (9) concerning the extent to which the pilotage requirement was not
 (10) enforced by the United States Coast Guard as of March 24,
 (11) 1989 You may consider the regulation and all the evidence
 (12) presented on this subject in evaluating plaintiffs' claims
 (13) You have also heard evidence about the certain provisions
 (14) of federal law and regulations, the so-called four hour rule
 (15) and the so called six-hour rule I've already discussed for
 (16) you what these provide
 (17) If you should find by a preponderance of the evidence that
 (18) defendants violated a law or regulation you may consider that
 (19) violation in evaluating plaintiffs' charge that defendants
 (20) conduct was reckless and that such conduct was a legal cause
 (21) of
 (22) the grounding of the Exxon Valdez Violation of a law or
 (23) regulation however, may or may not be reckless conduct In
 (24) order to find reckless conduct you must find by a
 (25) preponderance of the evidence that the conduct meets the
 definition of reckless conduct that I have previously given
 you whether or not the conduct involved violation of a law or

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- (1) regulation And in any event you may not find the violation
- (2) of a statute or regulation justifies a verdict against any
- (3) defendant unless the violation was a legal cause of the
- (4) grounding of the Exxon Valdez
- (5) Finally, if you find that any of the defendants believed
- (6) that they were in compliance with the six hour rule or the
- (7) four hour rule, you may consider the defendants beliefs along
- (8) with all the other evidence in the case in evaluating whether
- (9) defendants acted recklessly
- (10) You have heard evidence about the fact that Captain
- (11) Hazelwood was - was treated at South Oaks Hospital in 1985
- (12) Under federal law South Oaks Hospital was prohibited from
- (13) disclosing records to anyone, including the Exxon defendants,
- (14) pertaining to the treatment of Captain Hazelwood without
- (15) Captain Hazelwood's free and knowing consent
- (16) You have heard testimony concerning the Federal
- (17) Rehabilitation Act of 1973 Under the terms of this act, a
- (18) history of alcoholism or alcohol abuse is treated as a handicap
- (19) and an employer covered by the act is not permitted to
- (20) discriminate against any employee solely on the basis of that
- (21) history If, on the other hand, an employee's current use of
- (22) alcohol prevents the employee from performing the duties of
- (23) the employee's job or if, because of the employee's current use of
- (24) alcohol, continued employment of such employee would
- (25) constitute a direct threat to the property or safety of others then the

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- (1) employee is not covered by this provision of the act
- (2) Quote current end quote is to be determined in the light
- (3) of whether the employee's alcohol abuse problem is severe and
- (4) recent enough so that the employer is justified in believing
- (5) that the employee is unable to perform the essential duties of
- (6) his job
- (7) It is for the jury to decide whether any use of alcohol by
- (8) Captain Hazelwood was such as to prevent him from performing
- (9) the duties of his job or whether such use of alcohol if
- (10) proved would constitute a direct threat to the property or
- (11) safety of others
- (12) An employee like all citizens has a legally and
- (13) constitutionally protected right of privacy In formulating
- (14) policies for the management of its business an employer
- (15) should balance the employee's right of privacy against other equally
- (16) important concerns such as safety
- (17) Plaintiffs have introduced evidence of the results of
- (18) certain blood tests that were administered to certain crew
- (19) members of the Exxon Valdez Plaintiffs must prove by a
- (20) preponderance of the evidence that the test is reliable and
- (21) that the samples remain in an unchanged condition from the
- (22) time of collection until the time the samples were tested Although
- (23) this evidence has been admitted, you are the sole judges of
- (24) whether plaintiffs have proved such facts by a preponderance
- (25) of the evidence and whether the blood tests are reliable

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- (1) In considering whether the blood test is reliable
 - (2) moreover, you may consider all the other evidence introduced,
 - (3) including evidence with respect to the presence or absence of
 - (4) observable symptoms of intoxication
 - (5) In order to ensure the integrity and identity of blood
 - (6) samples, federal regulations governing the procedures for the
 - (7) administering of blood tests following a marine accident
 - (8) require the following one, a proper chain of custody must be
 - (9) maintained for each specimen from the time of collection
 - (10) through the time of testing and through the authorized
 - (11) disposition of the specimen,
 - (12) Two Blood specimens must be shipped to the laboratory in a
 - (13) cooled condition by any means adequate to ensure delivery
 - (14) within 24 hours of the receipt by the carrier,
 - (15) Three, No unauthorized personnel shall be permitted in any
 - (16) part of a collection site when specimens are collected, nor
 - (17) shall unauthorized personnel be allowed access to stored
 - (18) specimens,
 - (19) Four If a specimen is not immediately prepared for
 - (20) shipment it shall be safeguarded during temporary storage,
 - (21) Five, Every effort shall be made to minimize the number of
 - (22) persons handling the specimen,
 - (23) Six Chain-of-custody forms shall be at a minimum - got an
 - (24) extra word in there Change-of-custody forms shall at a
 - (25) minimum, include an entry documenting the date and the
- purpose

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- (1) each time a specimen is handled and identify each person in
- (2) the chain of custody,
- (3) Seven, The specimens shall be placed in containers designed
- (4) to minimize the possibility of damage during shipment and
- (5) those containers shall be securely sealed to eliminate the
- (6) possibility of undetected tampering
- (7) If you find that these federal regulations were not
- (8) complied with you may completely disregard the blood test or
- (9) you may give it such weight as you may think it deserves
- (10) The verdict must represent the considered judgment of each
- (11) juror In order to return a verdict, it is necessary that each
- (12) juror agree thereto Your verdict must be unanimous It is
- (13) your duty as jurors to consult with one another and to
- (14) deliberate with a view to reaching an agreement if you can do
- (15) so without violence to individual judgment
- (16) Each of you must decide the case for yourself but only
- (17) after an impartial consideration of the evidence in the case
- (18) with your fellow jurors In the course of your deliberations,
- (19) do not hesitate to re-examine your own views and change your
- (20) opinion, if convinced it is erroneous But do not surrender
- (21) your honest conviction as to the weight or effective evidence
- (22) solely because of the opinion of your fellow jurors or for the
- (23) mere purpose of returning a verdict Remember, at all times
- (24) that you are not partisans you are judges judges of the
- (25) facts Your sole interest is to seek truth from the evidence

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- (1) in the case
- (2) It is proper to add the caution that nothing said in these
- (3) instructions and nothing in any form of verdict prepared for
- (4) your convenience is meant to suggest or convey in any way or
- (5) manner any intimation as to what verdict I think you should
- (6) find What the verdict shall be is your sole and exclusive
- (7) duty and responsibility
- (8) Upon returning to the jury room, you will select one of your
- (9) number to act as your presiding juror The presiding juror
- (10) will preside over your deliberations and will be your spokesman
- (11) here in court A special verdict form has been prepared for
- (12) your convenience The special verdict form contains a number
- (13) of interrogatories The answer to each interrogatory must be
- (14) the unanimous answer of the jury
- (15) Your presiding juror will write the unanimous answer of the
- (16) jury in the space provided under each interrogatory When you
- (17) have finished answering the interrogatories you will have your
- (18) presiding juror date and sign the form and then return with
- (19) your verdict to the courtroom
- (20) If you should agree upon your verdict before five p m
- (21) tonight your presiding juror should date and sign the
- (22) verdict This will indicate that all of you have agreed to the
- (23) verdict You should return your verdict immediately into open
- (24) court in the presence of the entire jury together with the
- (25) exhibits and these instructions

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- (1) If you do not agree upon your verdict before five p m
- (2) tonight you may return to your homes You must not talk about
- (3) the case or your deliberations outside the jury room
- (4) Before you go home the presiding juror should lock the
- (5) jury room so that the exhibits instructions and unsigned
- (6) verdicts will remain undisturbed None of these materials
- (7) should be removed from the jury room until you reach a
- (8) verdict You should return to your jury room at 9 00 a m
- (9) tomorrow to continue your deliberations Deliberations should
- (10) not commence until all jurors are present in the jury room
- (11) If it becomes necessary during your deliberations to
- (12) communicate with the Court you may send a note by a bailiff
- (13) signed by your presiding juror or by one or more members of
- (14) the jury Any note to the Court should include the date and time
- (15) the note was signed, no member of the jury should ever attempt
- (16) to communicate with the Court by any means other than a
- (17) signed writing and the Court will never communicate with any member
- (18) of the jury on any subject touching the merits of the case
- (19) otherwise than in writing or orally here in open court
- (20) Bailiffs as well as all other persons, are forbidden to
- (21) communicate in any way or manner with any member of the jury
- (22) on any subject touching the merits of the case
- (23) Bear in mind also that you are never to reveal to any
- (24) person not even to the Court how the jury stands numerically
- (25) or otherwise on the questions before you until after you have

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- (1) reached a unanimous verdict
- (2) That completes the reading of the instructions You will
- (3) notice that I spoke of deliberating until five o clock and
- (4) starting at 9 00 That s the way we usually do it in this
- (5) court After consulting with counsel we have agreed that you
- (6) will decide whether you will deliberate from nine until five or
- (7) whether you ll stay on the same schedule that you ve been on
- (8) during the trial eight to two It will be your choice I
- (9) would suggest that you make that decision about the first thing
- (10) you do in the jury room and let us know what you re going to
- (11) do so that we ll know how to plan for it
- (12) Counsel will be working with me for the next few minutes to
- (13) pull together all of the exhibits but there are a lot of them
- (14) and it'll take a little bit of time to get that accomplished
- (15) and get it to you But I judge from what I ve seen this
- (16) morning that most of the work has probably been done and that
- (17) it will - while it ll take a few minutes, it s not going to
- (18) take a whole lot of time
- (19) We will also get you a second set of the jury instructions
- (20) so that you can make use of them
- (21) Let's see I ve covered one out of the two questions that
- (22) someone asked The other had to do with the - the heat
- (23) I ll be very frank with you I ve purposefully had people
- (24) keep the temperature down in here for two reasons This
- (25) machinery develops an awful lot of heat and people stay awake

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- (1) better when it s cool I take it from what has been said that
- (2) it may be a little bit cool in the jury room We'll try and
- (3) work on that and let us know how we're doing If you're
- (4) uncomfortable in there, let us know and we ll see what we can
- (5) do to accommodate you
- (6) Anything else before I send the jury off?
- (7) MR O NEILL No, sir there isn t
- (8) MR NEAL Not from us, Your Honor
- (9) MR CHALOS Nothing from us, Your Honor except our
- (10) thanks
- (11) THE COURT You re welcome
- (12) MR NEAL To everyone
- (13) THE COURT Ladies and gentlemen, if you would go to
- (14) the jury room now, we will get the materials to you just as
- (15) quickly as we can
- (16) (Jury out at 1 55 p m)
- (17) MR O'NEILL Did you swear the bailiff?
- (18) THE COURT He s already been sworn I think but as a
- (19) precaution, I'll ask him to make sure Would you when
- (20) everybody gets out have him simply step back in here and let s
- (21) make sure that he s taken the oath? Presumably that s -
- (22) MR O NEILL I don t care, I just -
- (23) THE COURT Some places it s the practice to swear
- (24) them over again every time We don t do that, but -
- (25) MR O NEILL That s fine

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- (1) THE COURT But I just want to make sure that this
 (2) particular bailiff has taken the oath someplace sometime so
 (3) that there isn't a question about it later
 (4) THE COURT While we're waiting, am I correct in
 (5) assuming that you've got the exhibits assembled at this point?
 (6) MR O'NEILL We're minutes away
 (7) THE COURT Have each of you checked the other's
 (8) work?
 (9) MR NEAL Yes, we have, Your Honor. It's my
 (10) understanding Mr. Jamin is - where is Mr. Jamin?
 (11) MR JAMIN We're comfortable. Your Honor, with the
 (12) issue
 (13) MR LYNCH Not confident but comfortable
 (14) MR JAMIN We've spent the last three days working on
 (15) it
 (16) THE COURT I'll take you at your word on this and
 (17) we're relying on your work to affirm that only those things
 (18) which have been admitted are going to go to the jury room
 (19) Mr. Bailiff, have you been sworn to act as a bailiff in
 (20) this court?
 (21) THE BAILIFF Yes, I have, Your Honor
 (22) THE COURT Thank you
 (23) The - couple of other things. Folks may be seated
 (24) please, unless you're tired of sitting in which case you can
 (25) stand

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- (1) It's inevitable. I think that we'll get some questions
 (2) from the jury. I don't know that we've ever talked about how I
 (3) typically handle questions from the jury so let me tell you
 (4) how I normally do that, tell me if you have any problem with
 (5) it. Tell me if you have any suggestions.
 (6) What I normally do is as soon as I get a note I contact
 (7) counsel on the telephone. Tell you that I've got an inquiry
 (8) tell you what it is. Given that all of the machinery that I
 (9) know all of you have got if you will provide Mr. Murtashaw
 (10) with the fax number that we should use for this purpose. I
 (11) will as soon as I get a note fax a copy of it to whomever you
 (12) tell me to fax it to.
 (13) After you've had time to get it and look at it I will get
 (14) you on the telephone and we will discuss the note. If we are
 (15) able to agree what response I should give to the note it will
 (16) be done. If we are not able to agree I will resolve the
 (17) disagreement.
 (18) If in the course of that kind of discussion anyone feels
 (19) that we are at a point where something needs to be put on the
 (20) record you need only say so and we will assemble and do it.
 (21) Often what we do is I make a decision and we put the matter
 (22) on the record a little later if that's agreeable to everybody
 (23) but you know we'll take that as it comes somewhat.
 (24) Does anyone have a problem with that approach?
 (25) MR O NEILL No sir

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- (1) MR NEAL I guess that implies that we don't need to
 (2) stay around the courthouse, as long as we give the Court a
 (3) number a phone number and a fax number
 (4) THE COURT That's part of what this is all about, so
 (5) that people don't have to camp on my doorstep. The one thing
 (6) that we insist on is that we know who it is we're supposed to
 (7) contact and that we have the number where we can reach the
 (8) person who you have designated and, if you want to change
 (9) from
 (9) time to time, that's your business so long as we know in
 (10) advance who the person is and where he or she is going to be
 (11) so
 (11) that we can contact
 (12) MR NEAL During the - during the hours of the
 (13) jury's deliberation - I understand that Mr. O'Neill goes down
 (14) to the Alaskan Bush Company some and we wouldn't want to
 (15) embarrass him by having him give you that number
 (16) THE COURT And where does he find you if he needs
 (17) to?
 (18) MR O'NEILL At the next table
 (19) MR NEAL I wouldn't want to say that
 (20) MR O NEILL At the next table, I think
 (21) THE COURT All right
 (22) Are we - are we of one mind on that? Mr. Chalos okay?
 (23) MR CHALOS Yes. No problem, Your Honor. I don't
 (24) endorse the Alaska Bush Company by the way. I know your
 (25) wife's in the audience

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- (1) MR O NEILL Thanks, Mike
 (2) MR NEAL I didn't know that. I take that back. I'm
 (3) sorry I let you down.
 (4) THE COURT We might just as well think for just a
 (5) moment about the possibility that we'll be asked for
 (6) play backs. If I get that kind of note, I'll of course follow
 (7) the drill that I've outlined to you about handling questions
 (8) from the jury. I hope that isn't going to get started because
 (9) if it does, it draws the deliberations out something ferocious
 (10) but we'll take those requests as they come.
 (11) Think with me for a moment though about how we're going
 (12) to do it if we get a request that we think we have to grant.
 (13) Am I correct that we have a - a transcript that we could use
 (14) to read back to the jury if need be?
 (15) MR NEAL Yes
 (16) MR O NEILL We have a complete transcript. I think
 (17) we ought to squash it to the extent we can squash it but if
 (18) worse comes to worst then we ought to just read it from the
 (19) transcript.
 (20) MR NEAL Well, I think we'd be - I agree, quash
 (21) them if we can because that can get you in a quagmire of
 (22) whether you're balancing the testimony on a particular point or
 (23) not so I agree with being reluctant to do that. But if it
 (24) happens if the Court decides it's going to then I guess you
 (25) read it from the transcript

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- (1) THE COURT Anything that anyone thinks of that we should be thinking about at this stage of things?
- (2) MR NEAL I think the Marshal has a note over there
- (3) THE COURT You have a note already
- (4) MR NEAL Ask him to read all the transcript again
- (5) THE COURT They've picked a foreman already It s -
- (6) it's Mr Murray and they're going to work from eight a m to
- (7) two p m Why am I not surprised
- (8) Anything else folks?
- (9) THE BAILIFF Your Honor, are we going to release them
- (10) now it s now 2 00?
- (11) THE COURT If they want to go now they're -
- (12) MR NEAL Thank you Your Honor
- (13) THE COURT Adjourned subject to call
- (14) (Recess at 2 05 p m)

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- (1) STATE OF ALASKA)
- (2) Reporter s Certificate
- (3) DISTRICT OF ALASKA)
- (6) I Joy S Brauer a Registered Professional
- (7) Reporter and Notary Public,
- (8) DO HERBY CERTIFY
- (9) That the foregoing transcript contains a true and
- (10) accurate transcription of my shorthand notes of all requested
- (11) matters held in the foregoing captioned case
- (12) Further that the transcript was prepared by me
- (13) or under my direction
- (14) DATED this day
- (15) of 1994
- (21) JOY S BRAUER RPR
- Notary Public for Alaska
- (22) My Commission Expires 5-10-97

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Look-See Concordance Report

 UNIQUE WORDS 3,265
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(1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 (3) In re:) Case No. 89-0095 CIV (HRD)
 (4)) Anchorage, Alaska
 (5) The Exxon Valdez) Monday June 13, 1994
 (6)) 10:00 a.m.

TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY 28TH DAY
 BEFORE THE HONORABLE H. RUSSEL HOLLAND, JUDGE

Phase One Verdict
 VOLUME 24, Pages 4137-4146
 Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 10 02 a m
 (3) (Call to Order of the Court)
 (4) THE COURT Mr Murray I understand you have a
 (5) verdict
 (6) THE FOREMAN We have a verdict Your Honor
 (7) THE COURT Would you pass it to the bailiff, please?
 (8) THE FOREMAN (Indicating)
 (9) THE COURT I'm going to read the verdict
 (10) Special verdict for phase one of trial interrogatory
 (11) number one Do you unanimously find on a preponderance of
 (12) the
 (13) evidence the defendant Hazelwood was negligent as that term
 (14) has
 (15) been defined in the instructions and that his negligence was a
 (16) legal cause of the grounding of the Exxon Valdez on March 24
 (17) 1989? Answer Yes
 (18) Interrogatory number two Do you unanimously find from a
 (19) preponderance of the evidence that defendant Hazelwood was
 (20) reckless as that term has been defined in the instruction, that
 (21) is his recklessness was a legal cause of the grounding of the
 (22) Exxon Valdez? Answer Yes
 (23) Interrogatory number three Do you unanimously find from a
 (24) preponderance of the evidence that the Exxon defendants were
 (25) reckless as that term has been defined in the instructions and
 (26) that their recklessness was a legal cause of the grounding of
 (27) the Exxon Valdez? Answer Yes

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(1) (Audience outburst)
 (2) THE COURT Knock it off
 (3) If you find - if you have completed all the answers to the
 (4) questions required of you by this verdict please have your
 (5) presiding juror sign this verdict and date it return it to the
 (6) Court Done at Anchorage Alaska this 13th day of June, 1994
 (7) Signed Kenneth Murray presiding juror
 (8) I m going to poll the jury ladies and gentlemen
 (9) Counsel is it your preference that I poll the jury as to
 (10) each interrogatory or should I do it en masse jointly as to
 (11) all three questions?
 (12) MR LYNCH Please poll as to each interrogatory, Your
 (13) Honor
 (14) THE COURT Ladies and gentlemen, polling the jury
 (15) means that I will simply ask each one of you whether the
 (16) verdict that I have just read is your true and correct
 (17) verdict If you concur in each of the interrogatories, you
 (18) should answer yes if not you should answer no
 (19) Ms Smith is interrogatory number one concerning the
 (20) negligence of defendant Hazelwood your verdict?
 (21) MS SMITH Yes
 (22) THE COURT Ms Hood?
 (23) MS HOOD Yes
 (24) THE COURT Ms Martin?
 (25) MS MARTIN Yes

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- (1) THE COURT Mr Dean is this your verdict?
- (2) MR DEAN Yes
- (3) THE COURT Ms Provost
- (4) MS PROVOST Yes
- (5) THE COURT Mr Graham
- (6) MR GRAHAM Yes
- (7) THE COURT Ms Moor
- (8) MS MOOR Yes
- (9) THE COURT Ms Spann is this your verdict?
- (10) MS SPANN Yes
- (11) THE COURT Ms Wilson
- (12) MS WILSON Yes
- (13) THE COURT Ms Garrison
- (14) MS GARRISON Yes Yes
- (15) THE COURT Ms Johnson
- (16) MS JOHNSON Yes
- (17) THE COURT Mr Murray
- (18) MR MURRAY Yes
- (19) THE COURT Thank you
- (20) Interrogatory number two having to do with the question of
- (21) whether defendant Hazelwood was reckless, your answer was
- yes
- (22) Ms Smith your verdict?
- (23) MS SMITH Yes
- (24) THE COURT Ms Hood
- (25) MS HOOD Yes

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- (1) THE COURT Ms Martin
- (2) MS MARTIN Yes
- (3) THE COURT Mr Dean
- (4) MR DEAN Yes
- (5) THE COURT Ms Provost
- (6) MS PROVOST Yes
- (7) THE COURT Mr Graham
- (8) MR GRAHAM Yes
- (9) THE COURT Ms Moor
- (10) MS MOOR Yes
- (11) THE COURT Ms Spann
- (12) MS SPANN Yes
- (13) THE COURT Ms Wilson
- (14) MS WILSON Yes
- (15) THE COURT Ms Garrison
- (16) MS GARRISON Yes
- (17) THE COURT Ms Johnson
- (18) MS JOHNSON Yes
- (19) THE COURT Mr Murray
- (20) MR MURRAY Yes
- (21) THE COURT Interrogatory number three having to do
- (22) with the reckless finding as to the Exxon defendants
- (23) Ms Smith is this your verdict?
- (24) MS SMITH Yes
- (25) THE COURT Ms Hood

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- (1) MS HOOD Yes
- (2) THE COURT Ms Martin
- (3) MS MARTIN Yes
- (4) THE COURT Mr Dean
- (5) MR DEAN Yes
- (6) THE COURT Ms Provost
- (7) MS PROVOST Yes
- (8) THE COURT Mr Graham
- (9) MR GRAHAM Yes
- (10) THE COURT Ms Moor
- (11) MS MOOR Yes
- (12) THE COURT Ms Spann
- (13) MS SPANN Yes
- (14) THE COURT Ms Wilson
- (15) MS WILSON Yes
- (16) THE COURT Ms Garrison
- (17) MS GARRISON Yes
- (18) THE COURT Ms Johnson
- (19) MS JOHNSON Yes
- (20) THE COURT Mr Murray
- (21) MR MURRAY Yes
- (22) THE COURT Counsel, the jury has been polled they
- (23) have all answered in the affirmative You have a verdict The
- (24) clerk will not enter judgment at this time because of the
- (25) nature of the verdict that has been returned but the verdict

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- (1) will be filed at this time
- (2) We have a couple of administrative things that we need to
- (3) take care of at this point ladies and gentlemen First off
- (4) because of the logistics of going on with the trial and my
- (5) necessity of being out of the district on Wednesday Thursday
- (6) Friday this week we decided on Friday I guess that it did
- (7) not make sense to try and crank up for phase two this week As
- (8) a consequence you will have a sort of a furlough until Monday
- (9) the 20th We will start up again with phase two at eight a m
- (10) on the 20th and which will begin much as the first phase
- (11) began
- (12) Second thing You understand, I m sure - and I know
- (13) counsel and the press understand - that it is inappropriate
- (14) for any of them to contact you about this case now because
- (15) you re not through The general public though may not
- (16) understand that You may have friends, relatives whatever
- (17) who will try and contact you to - wanting to discuss what s
- (18) going on and you just can't do that at this point
- (19) Probably for the next few days it would be a real good idea
- (20) to have somebody screen your phone calls Be especially
- (21) careful for the next few days so that you don t wind up in any
- (22) kind of conversations in person or on the phone with anybody
- (23) about your deliberations because it all has to remain
- (24) confidential at this point because you re not through
- (25) Please remember my instructions that you not read or listen

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- (1) to any media reports about the case because there may very well
- (2) be speculation about what went on and what is to come And you
- (3) need to insulate yourself from all discussion of the case of
- (4) any form until the case is finished
- (5) Counsel, is there anything else that we need to do on the
- (6) this point?
- (7) MR O NEILL I don t believe there is Your Honor
- (8) MR LYNCH Nothing Your Honor
- (9) MR RUSSO No Your Honor
- (10) THE COURT Okay Ladies and gentlemen thank you
- (11) very much We will see you at eight a m on a week from
- (12) today Court will be in recess now subject to call
- (13) (Jury out at 10 11 a m)

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- (1) STATE OF ALASKA)
- (2) Reporter s Certificate
- (3) DISTRICT OF ALASKA)
- (6) I Marianne Y Lindley, RPR CM a Registered
- (7) Professional Reporter and Notary Public
- (8) DO HERBY CERTIFY
- (9) That the foregoing transcript contains a true and
- (10) accurate transcription of my shorthand notes of all requested
- (11) matters held in the foregoing captioned case
- (12) Further that the transcript was prepared by me
- (13) or under my direction
- (14) DATED this 13th day of June 1994
- (20) MARIANNE Y LINDLEY, RPR
- Notary Public for Alaska
- (21) My Commission Expires 8 21 95

Look-See Concordance Report

UNIQUE WORDS 213
TOTAL OCCURRENCES 485
NOISE WORDS 385
TOTAL WORDS IN FILE 1,379

SINGLE FILE CONCORDANCE

CASE SENSITIVE

NOISE WORD LIST(S)
NOISE NOI

INCLUDES ALL TEXT OCCURRENCES

IGNORES PURE NUMBERS

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(1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 (3) In re) Case No. A89 0095 CIV (HRH)
 (4)) Anchorage Alaska
 (5) The EXXON VALDEZ) Monday June 20th 1994
 (6)) 8 00 a m
 (7) TRANSCRIPT OF PROCEEDINGS
 (8) TRIAL BY JURY 29th DAY
 (9) BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE
 (10) VOLUME 25 Pages 4147 4310
 (11) Realtime Transcription

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(1) P R O C E E D I N G S
 (2) (Jury in at 8 00 a m)
 (3) THE CLERK All rise
 (4) (Call to Order of the Court)
 (5) THE COURT Good morning ladies and gentlemen
 (6) MR O NEILL Good morning
 (7) MR NEAL Good morning
 (8) THE COURT This is the continuation of Case A89 0095
 (9) in re the Exxon Valdez We are beginning Phase II A this
 (10) morning
 (11) Ladies and gentlemen I have some further preliminary
 (12) instructions that I will read to you at this time We will now
 (13) begin Phase II of the trial in the case arising from the Exxon
 (14) Valdez oil spill In this phase of the trial plaintiffs will
 (15) present evidence in support of their claims for actual damages
 (16) what they say were legally caused by the Exxon Valdez oil
 (17) spill
 (18) The Exxon defendants have admitted that they are legally
 (19) responsible to compensate plaintiffs for any actual losses
 (20) proven to be proximately caused by the oil spill
 (21) In Phase I you determined that Defendant Hazelwood was also
 (22) legally responsible to compensate plaintiffs for any actual
 (23) losses proven to be proximately caused by the oil spill This
 (24) phase of the trial will be presented in two parts The first
 (25) part of Phase II of the trial which we will call Phase II A

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(1) will concern actual damages claimed by commercial fishermen
 and
 (2) their crews
 (3) The second part Phase II B will concern the actual
 (4) damages claimed by Alaska natives We are only concerned
 with
 (5) Phase II A at this time
 (6) In Phase II A plaintiffs who engaged in commercial fishing
 (7) and/or harvesting of salmon and herring and their crews will
 (8) present claims for actual losses that they claim resulted for
 (9) lost harvests of salmon in various years from Prince William
 (10) Sound Cook Inlet Kodiak and Chignik and from lost harvest
 (11) from herring in various years from Prince William Sound Kodiak
 (12) and Lower Cook Inlet When I say lost harvests I mean that
 (13) plaintiffs claim that they were unable to catch fish or as many
 (14) fish as a legal consequence of the oil spill
 (15) Plaintiffs further claim that the oil spill caused buyers
 (16) to lower the prices they paid to commercial fishermen for
 (17) salmon and herring Defendants deny that the commercial
 (18) fishing plaintiffs suffered losses claimed and also deny that
 (19) certain of the losses claimed were legally caused by the
 (20) spill
 (21) As in Phase I plaintiffs will begin by making an opening
 (22) statement outlining their case The defendants will also make
 (23) an opening statement outlining their case at the end of the
 (24) plaintiffs statement At the conclusion of this phase of the
 (25) trial each of the plaintiffs will present closing arguments as

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(1) to what they consider the evidence to have shown and to the
 (2) inference you should contend should be drawn from the
 evidence
 (3) presented I will give you additional instructions on the law
 (4) then you will be asked to retire and deliberate on the
 (5) questions presented and return a special verdict dealing with
 (6) the claims for actual damages which are made
 (7) I will now say a little bit about the standards applicable
 (8) to the claims you will be considering in Phase II A
 (9) The law provides that the plaintiffs are to be fairly
 (10) compensated for all damages if any to their businesses or
 (11) property which were legally caused by the spill For the oil
 (12) spill to be a legal cause in beginning about damage the
 (13) evidence must prove it is more likely true than not true that
 (14) one the oil spill was so important in beginning about the
 (15) damage that a reasonable person would regard it as a cause
 and
 (16) attach responsibility to it And two the damage would not
 (17) have occurred but for the oil spill
 (18) In arriving at the amount of award you should include any
 (19) damages suffered by the plaintiffs because of lost income that
 (20) is to say income which the plaintiffs would have made but for
 (21) the effect of the oil spill on their fishing business
 (22) Plaintiffs should be fairly compensated for their losses but
 (23) they should not profit from the oil spill On the other hand
 (24) plaintiffs are not to be awarded purely speculative damages
 (25) An allowance for lost income may be included in the award for

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(1) damages only when there is some reasonable basis for
 (2) determining that plaintiffs have in fact suffered a loss of
 (3) income even though the amount of such loss is difficult to
 (4) ascertain
 (5) In arriving at the amount of any loss of income sustained
 (6) by plaintiffs you are entitled to consider any past
 (7) performance of the plaintiffs fishing businesses as well as
 (8) any other evidence in the case bearing upon the issue
 (9) Payments that Exxon has made to fishermen need not be
 (10) considered The court will resolve any matters relating to
 (11) those payments in a later proceeding
 (12) I will now repeat certain of the general instructions which
 (13) I gave you at the beginning of Phase I of the trial Though
 (14) this may be repetitive it is important that you keep in mind
 (15) as you hear the evidence presented in each of the parts of
 (16) Phase II of the trial
 (17) Your function as jurors is to find and determine the facts
 (18) of the case Under our system of criminal procedure you are
 (19) the sole judges of the facts If at any time I should make a
 (20) comment regarding the facts you are at liberty to disregard
 (21) it It is especially important that you perform your duty of
 (22) determining the facts diligently and conscientiously for
 (23) ordinarily there is no means of correcting an erroneous
 (24) determination of fact by a jury On the other hand and with
 (25) equal emphasis I will instruct you about the law given by the

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(1) court constitutes the only law given to your guidance and it
 (2) is your only duty to accept it and follow it It is your duty
 (3) to follow the law as I give it to you even though you may
 (4) disagree with my statement of the law
 (5) As in Phase I the burden is on the plaintiffs to prove
 (6) every essential element of their claims by the preponderance of
 (7) the evidence If the proof should fail to establish an
 (8) essential element of plaintiffs claim by a preponderance of
 (9) evidence in the case the jury should find for the defendants as
 (10) to that claim
 (11) To establish - to quote establish by a preponderance of
 (12) evidence end quote means to prove that something is more
 (13) likely so than not so In other words a preponderance of
 (14) evidence in the case means such evidence as when compared -
 (15) when considered and compared with that opposed to it has
 more
 (16) convincing force and produces in your minds belief what is
 (17) sought to be proved is more likely true than not true This
 (18) rule does not of course require proof to an absolute
 (19) certainty since proof to an absolute certainty is seldom
 (20) possible in any case
 (21) The evidence in the case consists of all the testimony
 (22) exhibits and other evidence that has been admitted in Phase I
 (23) of this trial This evidence will be supplemented by the sworn
 (24) testimony of witnesses called in this next phase regardless of
 (25) who may call them and all exhibits received in evidence

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(1) regardless of who introduced them
 (2) Evidence may also consist of facts to which the lawyers
 (3) have agreed or stipulated Depositions may also be received in
 (4) evidence Deposition testimony may be accepted by you
 subject
 (5) to the same instructions which apply to witnesses testifying in
 (6) open court Many of the exhibits will be presented to you on
 (7) television screens exhibits thus presented are entitled to the
 (8) same consideration by you as physical exhibits in the form of
 (9) papers or objects received into evidence
 (10) Statements and arguments of counsel are not evidence in the
 (11) case unless identified by the court as an admission or
 (12) stipulation of fact or the attorneys on both sides stipulate or
 (13) agree to the existence of a fact You must unless otherwise
 (14) instructed accept the stipulation as evidence and regard the
 (15) fact as proof in this trial
 (16) Any evidence as to which an objection has been sustained by
 (17) the court and any evidence ordered stricken by the court must
 (18) be entirely disregarded Anything you may have seen or heard
 (19) outside the courtroom is not evidence and must be entirely
 (20) disregarded Some evidence is admitted for a limited purpose
 (21) only When I instruct you that an item of evidence has been
 (22) admitted for a limited purpose you may consider it for that
 (23) limited purpose and for no other You are to consider only the
 (24) evidence in the case but in your consideration of the evidence
 (25) you are not limited to the baled statements of the witnesses

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- (1) In other words you are not limited solely to what you see and
- (2) hear as the witnesses testify You are permitted to draw from
- (3) the facts which you find have been proved by the evidence
- (4) introduced at trial such reasonable inferences as you feel are
- (5) justified in the light of your experience
- (6) At the end of the trial of Phase II A you will be - you
- (7) will have to make your decision based on what you recall of the
- (8) evidence You will not have a written transcript to consult
- (9) and it is difficult and time consuming for the reporter to read
- (10) back lengthy testimony I urge you to pay close attention to
- (11) the testimony as it is given
- (12) As in Phase I if you wish you may take notes to help you
- (13) remember what witnesses say If you do take notes please
- (14) keep
- (15) them to yourself until you and your fellow jurors go to the
- (16) jury room to decide this phase of the case and do not let your
- (17) note taking distract you so that you do not hear other answers
- (18) by witnesses When you leave for the - when you leave at
- (19) night leave your notes in the jury room If you do not take
- (20) notes you should rely on your own memory of what was said
- (21) Surely if the notes of other jurors do not conform with your
- (22) memory of what evidence was offered at trial you should rely
- (23) on your memory of such evidence
- (24) In deciding the facts of this case you will have to decide
- (25) what witnesses to believe and what witnesses not to believe

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- (1) or none of it In deciding what to believe you may consider a
- (2) number of factors including the following One the witness
- (3) ability to see or hear or know the things the witness testified
- (4) to Two the quality of the witness memory Three the
- (5) witness manner while testifying Four whether the witness
- (6) had an interest in the outcome of the case or any motive bias
- (7) or prejudice Five whether the witness was contradicted by
- (8) anything the witness said or wrote before trial or by other
- (9) evidence And six how reasonable was the witness testimony
- (10) when considered in the light of other evidence which you
- (11) believe
- (12) A witness may be discredited or impeached by contradictory
- (13) evidence or by evidence that something the witness has said or
- (14) done or has failed to say or do something which is
- (15) inconsistent with the witness present testimony If you
- (16) believe any witness has been impeached and thus discredited
- (17) it
- (18) is your exclusive province to give the testimony of that
- (19) witness such credibility if any that you think it deserves
- (20) If a witness is showing knowingly to have testified falsely
- (21) concerning any material matter you have a right to distrust
- (22) such witness testimony in other particulars and you may reject
- (23) all the testimony of that witness or give it such credibility
- (24) as you may think it deserves in determining whether any fact in
- (25) issue has been proved by a preponderance of evidence in the

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- (1) The jury may unless otherwise instructed consider the
- (2) testimony of all witnesses regardless of who called them and
- (3) all exhibits received in evidence regardless of who may have
- (4) produced them The rules of evidence ordinarily do not permit
- (5) witnesses to testify as to opinions or conclusions An
- (6) exception to this rule exists as to those who we call expert
- (7) witnesses Witnesses who by education and experience have
- (8) become expert in some art science profession or calling may
- (9) state an opinion as to relevant and material matters in which
- (10) they profess to be expert and may also state their reasons for
- (11) the opinion You should consider each expert opinion received
- (12) in evidence and give it such weight as you may think it
- (13) deserves
- (14) If you should decide that opinion of an expert witness is
- (15) not based upon sufficient education and experience or if you
- (16) should conclude that the reasons given in support of the
- (17) opinion are not sound or if you feel that it is outweighed by
- (18) other evidence you may disregard the opinion entirely
- (19) Any statement ruling remark or comment which I may make
- (20) during the course of the trial is not to indicate any opinion
- (21) or should influence you in any way in your determination of the
- (22) facts
- (23) At times I may ask questions of witnesses If I do so it
- (24) is for the purpose of bringing out matters which I feel should
- (25) be brought out and not in any way to indicate matters about the

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- (1) facts or the weight you should give the testimony of the
- (2) witness
- (3) Attorneys representing the parties in this trial have a
- (4) right and duty to object to questions or argument offered by
- (5) the opposing side if such attorneys believe in good faith that
- (6) such offered evidence questions or argument are
- (7) objectionable
- (8) under our rules of evidence or procedure At times the
- (9) attorneys may request the opportunity to discuss matters out of
- (10) your hearing We will endeavor to keep this kind of conference
- (11) to an absolute minimum We will defer matters requiring
- (12) discussion until the end of the day so your period in court
- (13) should be done exclusively to the taking of testimony
- (14) You should not be critical of any lawyer or client because
- (15) objections are made regardless of whether I sustain or
- (16) overrule those objections and you should draw no inference
- (17) from or against any party because objections were made
- (18) because
- (19) matters were discussed out of your hearing or because I
- (20) sustained or overruled such objections
- (21) It is the duty of the court to admonish any lawyer because
- (22) out of the zeal for his client does something which is not in
- (23) keeping with the rules of evidence or procedure You are to
- (24) draw no inference against the side to whom admonishing of the
- (25) court may be addressed during the trial in this case

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(1) trial Statements contained in the media accounts are not
 (2) evidence You must lay aside and completely disregard
 anything
 (3) you may have read or heard about the case outside the
 (4) courtroom and your verdict must be based solely and
 (5) exclusively on the evidence presented in court in accordance
 (6) with the court s instructions to you at the close of each phase
 (7) about which you will apply the evidence If you read or hear
 (8) anything about this case outside the courtroom you should
 (9) bring such facts to my attention at once
 (10) Let me repeat a few words about your conduct as jurors
 (11) now Do not talk to each other about the case or about anyone
 (12) who has anything to do with it until the end of this phase of
 (13) the case when you go to the jury room to decide your verdict
 (14) Do not talk with anyone else about this case or about anyone
 (15) who has anything to do with it until all phases of the trial
 (16) have ended and you have been discharged as jurors Anyone
 (17) else end quote includes members of your family and friends
 (18) You may tell them that you are a juror in the case but don t
 (19) tell them anything else about it until you have been discharged
 (20) by me Do not let anyone talk to you about the case or about
 (21) anyone who has anything to do with it If someone should try
 (22) to talk to you you should report it to me immediately Do not
 (23) read any news stories or articles or listen to any radio or TV
 (24) reports about the case or about anyone who has anything to do
 (25) with it Do not do any research or make any investigation

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(1) about the case on your own
 (2) If at any time and until you are discharged by me at the
 (3) end of the trial any information about this case should happen
 (4) to be seen or heard by you inadvertently by any source other
 (5) than here in the courtroom you should promptly make a note of
 (6) what happened what you saw or heard You should pass the
 note
 (7) to Mr Murtiashaw my in court clerk or one of the jury
 (8) clerks They will pass the note to me and I will take the
 (9) necessary action
 (10) Do not make up your mind about what the verdict should be
 (11) until after I have given you my instructions on the law and you
 (12) have gone to the jury room to decide this phase of the case
 (13) Even then do not make up your mind until you and your fellow
 (14) jurors have discussed the evidence
 (15) As with Phase I we will conduct this trial from 8 a m to
 (16) 2 p m We will take two evenly spaced 15 minute breaks during
 (17) this time Each morning of the trial you should first report
 (18) to the jury assembly room The jury clerk will take role and
 (19) escort you to the jury room behind the courtroom As a
 (20) courtesy to the court counsel and your fellow jurors please
 (21) arrange to be in the courthouse and in the jury assembly room
 (22) at least 15 minutes before 8 a m It s my desire to start
 (23) promptly at 8 a m and we will adjourn promptly at 2 p m
 (24) Finally should any juror find it necessary to communicate
 (25) with the court for any reason during the trial that

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(1) communication should be in writing and should be
 accomplished
 (2) by giving your note either to a jury clerk or to my in court
 (3) clerk usually Mr Murtiashaw
 (4) This completes my preliminary instructions
 (5) We didn t talk about how long for opening statements on
 (6) this phase Have you all talked about it?
 (7) MR LYNCH Yes
 (8) MR O NEILL Yes
 (9) THE COURT Do you have an agreement?
 (10) MR O NEILL Yes
 (11) THE COURT What is it?
 (12) MR O NEILL I will go no longer than an hour and 15
 (13) minutes and Mr Lynch will go no longer than an hour and a
 (14) half and it s my hope we will not be longer than that
 (15) MR RUSSO I have five minutes
 (16) MR LYNCH That s counted in the hour and a half
 (17) THE COURT Let s go
 (18) MR O NEILL Thank you Judge May it please the
 (19) court counsel ladies and gentlemen
 (20) The batting order that you re going to see from the
 (21) plaintiffs is slightly different for Phase II I will have
 (22) with me Lynn Sarko who represents Prince William Sound
 (23) fishermen and my partner Steve Schroer in addition to Lori
 (24) Wagner and Matt Jamin who you saw in Phase I but when they
 (25) stand up that s who they are

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(1) Crude oil and fish don t mix You can t manage an oiled
 (2) fishery you can t effectively fish an oiled fishery You
 (3) can t sell fish from an oiled fishery Fish don t thrive in an
 (4) oiled fishery and if you own a fishing permit you can t sell
 (5) a fishing permit from an oiled fishery Crude oil and fish
 (6) don t mix And fishermen and women fishers can t make a
 living
 (7) for their families in oiled fisheries
 (8) Now in this phase of the trial we re going to talk about
 (9) that and we re going to talk about plaintiffs compensatory
 (10) damages We re leaving the subject of recklessness and we re
 (11) not yet to the subject of punitive damages so we re going to
 (12) talk about compensatory damages What actual monetary
 damages
 (13) are due the plaintiffs as a result of the Exxon Valdez oil
 (14) spill And in two ways as the Judge instructed you we re
 (15) going to talk about commercial fishermen We ll have an
 (16) opening we ll put on our proof Exxon will put on its proof
 (17) we will have a closing and you ll go back and you ll
 (18) deliberate
 (19) Now in Phase II A we re going to deal with biology and
 (20) economics and I m going to - my one sort of pro pointer for
 (21) the day there is going to be all kinds of economic charts that
 (22) look like this and they will deal with fish run sizes and four
 (23) or five different fisheries and fisheries economics and they
 (24) will be put on the TV screen And you will drive yourselves
 (25) crazy if you try to write down all the numbers and you won t

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- (1) listen to the substance behind the numbers if you try to write
- (2) down all the numbers
- (3) In my closing argument the one thing that I will do is I
- (4) will put up a verdict form a big board of the verdict form and
- (5) I will tie these exhibits to the verdict questions So if
- (6) there is a specific special verdict question that deals with
- (7) Upper Cook Inlet in 1989 and the lost harvest in the closing
- (8) argument I'll say when you get to that special verdict
- (9) question look at Exhibit 289 And at that point in time we
- (10) can inventory the exhibits compare them to the verdict form
- (11) but that ought to solve the problem of sitting here This is
- (12) just one small chart that has 50 numbers on it and it ought to
- (13) solve the problems of scribbling down the numbers And the
- (14) numbers represent truths and we ought to be concentrating on
- (15) the truths that underlie the numbers and then we will match
- (16) the numbers up at the end
- (17) Now the specific categories of damages that we're going to
- (18) talk about - before I get to that I want to go back to both
- (19) the opening that we had in the courtroom next door and the
- (20) opening that we had in this courtroom And Exxon Corporation
- (21) in its openings admitted that it was a terrible oil spill it
- (22) undoubtedly had harmful effects on the fishermen plaintiffs and
- (23) the native plaintiffs That the plaintiffs are entitled to
- (24) compensation and Exxon Corporation should pay them
- (25) compensation And Exxon Corporation fully expects you will

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- (1) decide what they should pay and Exxon said to you the court
 - (2) and the plaintiffs that the plaintiffs natives and fishermen
 - (3) are entitled to full compensation for their loss Now that's
 - (4) what Exxon said when we started this trial that the
 - (5) plaintiffs the fishermen and the natives are entitled to full
 - (6) compensation for their loss Now I will bet you dollars to
 - (7) doughnuts that over the course of the next two weeks we're
 - (8) going to hear a different story from Exxon Corporation
 - (9) Now the categories of losses that we're going to talk
 - (10) about fall into fish that weren't caught the year of the
 - (11) spill If a fishery was closed or there were restrictions on
 - (12) the fishery the fishermen didn't catch fish the year of the
 - (13) spill that's the first category
 - (14) The second category of loss is fish price People don't
 - (15) buy fish from oiled fisheries People in the Lower 48 or in
 - (16) France or in Japan when they read about the Exxon Valdez oil
 - (17) spill happening in one of the richest salmon fisheries in the
 - (18) world are less interested in buying fish from that salmon
 - (19) fishery You don't want to eat fish that comes from an unsafe
 - (20) place that's the second category
 - (21) The third category of loss that we're going to talk about
 - (22) is harvest after 1989 There were certain fisheries Prince
 - (23) William Sound Kodiak Upper Cook Inlet where the oil either
 - (24) impacted the land water margin where the fish thrive or
 - (25) impacted the management of the fishery in such a way that
- there

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- (1) are long term damages to the fisheries That's the third
 - (2) category
 - (3) And the fourth category is that there are about 200 plus
 - (4) fishermen who had permits and who have sold their permits
- since
- (5) the time of the spill and their fishing permits are worth a
 - (6) heck of a lot less than they were at the time of the spill
 - (7) Who wants to buy a permit in damaged fisheries
 - (8) Those are the four '89 harvest losses fish price years
 - (9) after 1989 and permits And we'll have biologists and
 - (10) fisheries economists take us through that
 - (11) Now I want to talk a little bit about fishing businesses
 - (12) Commercial fishermen are like farmers Corporations cannot
- own
- (13) a fishing permit in Alaska you have to be an individual and
 - (14) you get a fishing permit for a specific area They are called
 - (15) limited entry permits And let's take Upper Cook Inlet as an
 - (16) example In Upper Cook Inlet for drift boats there are only
 - (17) 586 So we have a limited resource 586 people get to fish
 - (18) that resource out of drift boats Now fishing businesses are
 - (19) family businesses for the most part It is not uncommon for a
 - (20) fisherman to fish with his wife or a woman to crew They are
 - (21) family businesses and like farm family businesses you have
 - (22) to - the expression you have to make hay while the sun
 - (23) shines is a fact of life in fishing And in deed both with
 - (24) regard to harvest levels and fish prices they were static in
 - (25) the early 80s through 1985 1986 87 88 the sun was

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- (1) shining And then you get an oil spill in 1989 and bad things
 - (2) happen But fishing is like farming and you do have to make
 - (3) hay while the sun shines and that's where that expression
 - (4) comes from
 - (5) Commercial fishing is like many other outdoor occupations
 - (6) hard work not for the lazy not for the fainthearted people
 - (7) die fishing Fishing is backbreaking work and while fishermen
 - (8) only fish for that one July month when the fish are in the
 - (9) inlet or that one April or May period when herring are in
 - (10) Prince William Sound or in late June or early July when the
 - (11) pinks are in Prince William Sound there is a lot that goes
 - (12) into that fishing period Months of preparation A fisherman
 - (13) cannot afford to have his equipment down for one day when the
 - (14) fish are out there it will kill him
 - (15) So there are months of preparation that go into a fishing
 - (16) season and there are years of learning how to fish that go
 - (17) into a fishing season And fishermen have two primary assets
 - (18) Other than themselves and their families they have two primary
 - (19) assets They have their permit and their boat And a fishing
 - (20) permit at the height of the Alaska wild salmon fisheries in
 - (21) 1988 fishing permits could cost as much as \$250,000 Boats
 - (22) could cost anywhere from \$40,000 to \$600,000 And most of
- the
- (23) fishermen like other small businessmen they are in addition
 - (24) to being fishermen
 - (25) Small businessmen can't afford to come up with that kind of

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(1) cash to get into the business so they borrow money from one of
 (2) many institutions to pay for the boat and the permit and they
 (3) rely on the fishing income to make the boat and permit
 (4) payments Makes sense that s how we run small businesses
 (5) But there is an awful lot of preparation that goes into a
 (6) fishing season from the buying of the permit and the boat to
 (7) the preparation for the season to a lifetime of preparation
 (8) for being a fishermen to the selection of being a fishermen
 (9) Fishermen are - when we went through the voir dire
 (10) process I asked each of you why you live in Alaska The
 (11) reason I asked that question was for today They live in
 (12) Alaska because they like to make a living outdoors with their
 (13) hands on the sea they like the work they like the risk they
 (14) were born to fish the same way you and I were born to do what
 (15) we do That s why fishermen live in Alaska And most
 (16) fishermen do live in Alaska
 (17) Now I want to show you an exhibit from Phase I which is
 (18) the NOAA hindcast map which shows where the oil went the first
 (19) couple days after the spill and if we could run that it s the
 (20) one on the yellow
 (21) This is Prince William Sound in the black area and it
 (22) shows up a little bit better on the TV monitors as the oil in
 (23) the hours and the few days after the spill Now most of that
 (24) area where that oil is going through is a prime fishery The
 (25) area where the Prince William Sound pink salmon go through

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(1) thrive and the oil is now - much of it stays where it is but
 (2) a lot of it is moving around the bottom of the Kenai
 (3) Peninsula You wait and think it s never going to get down
 (4) there but it does
 (5) This is here the bottom of the peninsula Cook Inlet and
 (6) Anchorage is up and we ll look at another map in a minute
 (7) But the oil eventually gets down to the bottom of the Kenai
 (8) Peninsula gets to Kodiak gets to the Alaska Peninsula and
 (9) the Upper Cook Inlet tidal rips are the second strongest bodies
 (10) of water in the world you can watch them there that s the
 (11) tide going in and out The oil extends itself to Kodiak
 (12) extends down to Chignik down to the Alaska Peninsula goes
 (13) up
 (14) the inlet So it devastates Prince William Sound first and
 (15) then it brings its disaster with it as it moves around and
 (16) these are the people that it affected
 (17) The first is and I m going to show you just some short
 (18) videotapes you ll see longer versions of these videotapes but
 (19) this is Oliver Holm who is a Kodiak herring fisherman This
 (20) will give you a little bit of an idea what a herring set up is
 (21) like That s him and that boat little skiff was pulling out
 (22) the seine rig That s what his vessel looks like
 (23) Here is Mary Jacobs who is a Kodiak salmon seiner Those
 (24) are salmon And Les Meredith who is an Upper Cook Inlet
 (25) drifter A drift rig is a little bit different kind of rig
 (26) than a seining rig Those splashes that s fish hitting the

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(1) net Linden O Toole is a Prince William Sound salmon fisher
 (2) and this is a picture of her vessel and this is her over to
 (3) the - right here working on the boat This is the picture of
 (4) her vessel and the last picture of her vessel
 (5) So these are the people who fish They fish outside they
 (6) work hard And interestingly enough on the night of the
 (7) spill they were if they were herring fishermen getting ready
 (8) to go fishing in Prince William Sound And if they were salmon
 (9) fishermen they were starting to prepare for the fishing
 (10) season
 (11) Now I have here a map of Alaska and the primary areas
 (12) that we re going to be talking about are Prince William Sound
 (13) which is primarily a pink fishery pink salmon fishery and
 (14) we re going to talk a little bit about salmon types in a
 (15) minute Although there is a red fishery up the Copper River
 (16) Kodiak which is a red fishery and Kodiak fishermen fish in
 (17) this general area Chignik and Cook Inlet Those are the four
 (18) principal areas we re going to talk about and we re going to
 (19) break them down
 (20) Now each of these four principal areas has a different
 (21) management regiment different rules of the game and in
 (22) regulating a fishery you have two ways to regulate the
 (23) fishery You have the number of people you let fish there the
 (24) number of permits and when you let them fish that is time
 (25) And the fisheries in these areas are managed as sustainable

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(1) harvest fisheries So there are three elements to the run
 (2) when the fish run comes First there is the overall size of
 (3) the run The second is there is the take which is commercial
 (4) fishermen and subsistence fishermen they take out of the size
 (5) of the run And then the third is you want enough what they
 (6) call escapement so the fish continue to thrive in future
 (7) years So we re worried both about the catch for that year and
 (8) about enough fish either getting up stream or up into the lakes
 (9) so we have fish for future years
 (10) Now I want to talk a little bit about fish because fish
 (11) have different life signs We can leave this up and just use
 (12) the TVs There are five different kind of Pacific salmon and
 (13) one kind of Atlantic salmon And the five different kind of
 (14) Pacific salmon are king salmon sockeye or red salmon pink
 (15) salmon chum salmon and coho silvers
 (16) And this is the sockeye life style (indicating) Now
 (17) sockeye and pinks are the two that I m going to talk about
 (18) today By the way sockeye is a five year fish Sockeye are
 (19) the only fish that spawn in lakes and they spawn for example
 (20) in this little part of Alaska up the Kenai in Skilak and Kenai
 (21) lakes and if they go up the Kasilof they spawn in Tustumena
 (22) Lake And then they spend the first year or two up the lake in
 (23) fresh water growing And after spending the first year or two
 (24) up in the lake growing they go out to sea so they live in
 (25) both the fresh water and salt water Then they come back after

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(1) a life of about five years to go back oddly enough to go
 (2) back to the same streams that they were - or lakes that they
 (3) were born on and how they find them is one of the great
 (4) mysteries of science
 (5) And we catch some on the way back and some go back to
 make
 (6) sure there is a future run and when they get back up sockeye
 (7) when they get back up to streams into the lakes which they
 (8) spawn they lay eggs and the cycle starts all over again
 (9) Sockeye are on the market the biggest highest priced
 (10) fish And I'll talk a little bit about fish markets in a
 (11) minute but sockeye salmon are sold out of these fisheries to
 (12) the Japanese primarily as fresh frozen
 (13) Now we have pink salmon who have a two year life cycle
 (14) And you can see on this one that the egg incubation happens in
 (15) the fall and they spend the winter and spring and the next
 (16) summer getting ready to go out to sea Now the pinks are a
 (17) little bit different than the reds because the pink salmon are
 (18) dependent upon the shoreline in Prince William Sound for their
 (19) early growth The reds are up in the lake but the pink salmon
 (20) depend on that land water margin in Prince William Sound for
 (21) their early growth So if you destroy the land water margin
 (22) or you hurt the land water margin or you poison the land water
 (23) margin you hurt the pink salmon
 (24) Now the third fish that we're going to talk about that
 (25) were affected are herring Now herring don't spawn in fresh

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(1) water like pinks and the reds do they spawn again in areas
 (2) close to the land water margin so their health is again
 (3) dependent on the land water margin in Prince William Sound
 and
 (4) they have again a complicated multiple year life cycle So
 (5) these organisms these fish are a very very complicated very
 (6) very sensitive living creature who depend on clean water for
 (7) their biological health And the thing about Alaska is Alaska
 (8) is the last great wild salmon fishery in the world
 (9) Much of the salmon - there are five kinds of Pacific
 (10) salmon but much of the salmon that is now sold in the world
 (11) and it's more so and more so in part because of the spill is
 (12) farmed Atlantic salmon And farmed Atlantic salmon at least
 (13) to an Alaska fishermen is a cheap substitute for Alaska wild
 (14) salmon It doesn't have the glamour the allure the purity of
 (15) the Alaska salmon and the Japanese perceive it that way
 Now
 (16) that's sort of the life cycle of these fish
 (17) In Prince William Sound we're going to focus primarily on
 (18) pinks In Upper Cook Inlet Kodiak and Chignik we're going to
 (19) focus primarily on reds and for all three of the fisheries
 (20) we'll talk some about herring
 (21) Now in 1989 there were fishery closures There were
 (22) fishery closures in all of these areas and indeed for Upper
 (23) Cook Inlet drifters they didn't fish at all that season Now
 (24) what we have to do here in the courtroom is figure out what
 (25) would have been caught but for the spill and we will never

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(1) know with certainty what would have been caught but for the
 (2) spill because it didn't happen We've got to use scientific
 (3) tools to go back and figure it out And those scientific
 (4) tools despite science are not as precise as we would like
 (5) them to be
 (6) The reason that we don't know how many fish would have been
 (7) caught is because of the oil spill The reason we don't know
 (8) the exact numbers is Exxon's fault Now the Alaska
 Department
 (9) of Fish & Game keeps statistics on fish numbers and we're
 (10) going to use their rough statistics and we're going to use
 (11) those statistics and give those statistics to a couple fish
 (12) experts Don Rogers is one Greg Ruggerone is another and
 (13) we're going to ask them using scientific methods to tell us
 (14) what those fish run sizes would have been but for the spill
 (15) First element of damage
 (16) The people that we will have come and testify about that
 (17) include Ken Parker who was the director of commercial
 (18) fisheries at the time the spill happened and a fellow named
 (19) Phil Mundy who is a renowned fish scientist Rogers and
 (20) others And we'll reconstruct the runs that's what they call
 (21) it run reconstruction and we'll do that and come up with
 (22) these numbers
 (23) Now I want to talk a little bit about these pinks and reds
 (24) that are sold Sockeye salmon are sold to the Japanese 90
 (25) percent of the sockeye salmon harvested in the State of Alaska

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(1) goes to the Japanese Pinks primarily are canned and are sold
 (2) throughout the United States and Europe so they go off in two
 (3) different directions Herring is harvested for its eggs and
 (4) those are sold to the Japanese So those are the three
 (5) different markets that we have
 (6) Now the spill in 1989 was one of the most notorious events
 (7) of that year and you knew about it whether you lived in Japan
 (8) or Paris France or in the United States and the price of fish
 (9) collapsed in 1989 The price of Alaska fish collapsed in
 (10) 1989 For example in 1988 a fishermen got \$2 50 a pound for
 (11) his fish off the vessel ex vessel In 1989 he got a buck 50 a
 (12) pound \$2 50 before the spill a buck 50 after the spill
 (13) The same thing happens with regard to pinks and herring
 (14) Every fish price in Alaska collapsed between 1988 and 1989
 (15) Pinks went from 80 to 40 sac roe went from 50 cents to 21
 (16) cents a pound Before the spill good healthy prices after the
 (17) spill they were poor prices Why? The spill People don't
 (18) like to buy fish from oiled fisheries that's the first thing
 (19) The second thing is from a business perspective If we take -
 (20) let me explain to you a little bit about the chain of command
 (21) for selling fish Fishermen goes out and catches the fish
 (22) brings the fish into a fish processor what we used to call a
 (23) cannery The cannery buys the fish from the fishermen and in
 (24) turn sells them to Japanese buyers or stateside buyers A
 (25) Japanese buyer when he buys that fish takes a tremendous

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(1) risk His risk is can he sell it in Japan If it s oiled fish
 (2) coming out of an oiled fishery he has a risk whether he ll get
 (3) it into Japan If one salmon is oiled they will embargo the
 (4) whole pack The Japanese consumers read about Alaska oil
 (5) spills and they have a choice of a lot of other different
 (6) kinds of salmon from a lot of other kinds of places they have
 (7) a choice of tuna they quit buying salmon and the prices
 (8) collapses price also collapsed because of herring
 (9) We re going to put on two economists to do two very
 (10) different things with regard to this The first is Dr Jim
 (11) Crutchfield who is the first and foremost fish economist in
 (12) the world He s going to explain how the system works and why
 (13) the prices collapsed The second is Rob Mendelsohn from Yale
 (14) who is a economatrician who does mathematical modeling
 He s
 (15) going to show us what the prices would have been but for the
 (16) oil spill
 (17) Now Exxon with regard to every item of damage we re going
 (18) to try to prove is going to try to get away from it This
 (19) promise with regard to full compensation will not mean a heck
 (20) of a lot in the next two weeks With regard to fish price
 (21) they are going to say the fish price collapsed before and after
 (22) the spill because of farmed salmon from Europe and we re
 going
 (23) to hear a lot about that But the fish price didn t collapse
 (24) because of farmed salmon from Europe it collapsed because of
 (25) the obvious reason of the oil spill And in 1989 when the

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(1) price did collapse farmed salmon from Europe was not a major
 (2) player in the Japanese market where most of the red salmon
 (3) went But it is an excuse and we ll hear the excuse
 (4) So fish price is a big part of the case what the
 (5) fishermen - and fish price goes to these families If the
 (6) difference - if you re catching fish at 2 50 2 60 2 70 and
 (7) all of a sudden you re getting a buck for it you can t make
 (8) your boat payment permit payment it s tough to pay for the
 (9) groceries So while it s economics that translates into an
 (10) individual fisherman s pocket fish price is the most important
 (11) thing that we re going to look at over the next two weeks
 (12) So we ve talked about 1989 harvests and we ve talked about
 (13) fish price And the third thing I want to talk about is
 (14) long term damage to the fisheries And there are two
 (15) mechanisms that play The first is in Prince William Sound
 (16) The oil was spilled but didn t just go away You don t put
 (17) things into the environment and then they just disappear Exxon
 (18) notwithstanding And what happens in Prince William Sound is
 (19) not only do we get disruption in 89 but there are fishery
 (20) closures in 1990 too But most importantly the oil stays in
 (21) the ecosystem it stays on the beaches it stays under rocks
 (22) it stays in mussel beds And the land water margin where this
 (23) oil is is where pink salmon thrive And there are good salmon
 (24) harvests in 90 and 91 but then the biology the complicated
 (25) biology of that salmon and that oil catches up and the pink

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(1) salmon fisheries collapse in 92 and 93 And herring who
 (2) spawn and thrive in this land water margin come back in 1994
 (3) diseased and lesioned and there is no herring season in 1994
 (4) So the first mechanism that we re going to look at is the
 (5) effect of crude oil on the land water margin and how things
 (6) looked fine for a year or two and then everything is shot
 (7) And that again if you re a fishing family who has a herring
 (8) permit and you can t fish for those few days in April when you
 (9) make your money your investment in your boat your
 investment
 (10) in your permit your investment in your life all goes down the
 (11) tubes That s the first mechanism
 (12) The second mechanism is Chignik Kodiak and Cook Inlet
 (13) they regulate the escapement up the rivers You want just so
 (14) many fish up the river If you have too many fish up the
 (15) river with too much spawning the fish overgraze and in
 (16) subsequent years there isn t enough little bugs little plants
 (17) for the fish to eat If you have too few fish you don t get
 (18) enough eggs so Alaska Fish & Game regulates these fisheries
 so
 (19) they get the right number of fish and these are called
 (20) escapement levels and you want the escapement levels to be
 in
 (21) the proper range for the long term health of the fishery
 (22) If there is an oil spill and you don t know whether the
 (23) fleet is going to fish on one day or the next day or at all it
 (24) becomes impossible to regulate the escapement and in
 Chignik
 (25) Kodiak and Cook Inlet they had overescapement too many fish

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(1) got up the river they didn t have the commercial fish boats to
 (2) catch the fish they couldn t allow the commercial fish boats
 (3) to fish for oil salmon too many fish get up the river they
 (4) overgraze and we are seeing this year a collapse with regard
 (5) to the red salmon fisheries in Chignik Kodiak and Upper Cook
 (6) Inlet
 (7) Now after the salmon are coming back after five years
 (8) running up here why didn t they let the commercial fishermen
 (9) fish in 1989 Because of what is called a zero tolerance
 (10) policy People are so concerned about one fish one oiled fish
 (11) getting on the market that the State of Alaska the fishermen
 (12) the fish processors and Exxon all supported what was called
 the
 (13) zero tolerance policy If there was a chance we were going to
 (14) catch an oiled fish we are not going to fish
 (15) Now is there any history behind that? Yeah in the early
 (16) 80s 1983 there was one can of tuna that had botulism in it
 (17) that made its way to Europe one can And the price fell out
 (18) of the bottom of the Alaska fish market So that fear of taint
 (19) in the fish is so great and what it can do to all these
 (20) livelihoods There are 3300 permit holders for salmon and
 (21) herring 3300 permit holders that fear of taint and putting
 (22) these families out of business we didn t fish if there is a
 (23) potential for catching an oiled fish
 (24) Well I m sure Exxon will take the position well it
 (25) wasn t their fault the state was the one that imposed the zero

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(1) tolerance policy but it was Exxon's oil and Exxon agreed to
 (2) the zero tolerance policy and the zero tolerance policy made
 (3) good sense at the time and it makes good sense today You
 (4) don't fish one oiled fish gets through to Japan and the entire
 (5) fish market collapse we've talked about 89 harvests fish
 (6) price future harvests fish permits is the fourth thing that
 (7) we're going to talk about
 (8) A fishing permit a good fishing permit in one of these
 (9) areas in 1988 sold for \$250,000 There is a market for them
 (10) they are traded openly and freely A good fishing permit in
 (11) one of these areas today sells for 60 or \$70,000 and that's
 (12) because of the oil spill and the long term impacts of the oil
 (13) on the health of these fisheries and if you're a fisherman and
 (14) that permit and boat are your principal assets and you bought
 (15) it at a price of 250,000 and now it's worth 70,000 you've got
 (16) big problems And we have over 200 fishermen that bought
 (17) and sold low one of them was Linden O Toole who was the
 (18) fisher
 (19) that we looked at in pictures and that's another element of
 (20) damage
 (21) Now I said there were 3300 permits there are 3300 fishing
 (22) permits and each of these permits normally has one two or
 (23) three deckhands that fish with a permit holder Many times
 (24) family members many times friends so we get about 10,000
 (25) 10,000 fishermen in an area that encompasses a size of many
 (26) many states and this area is in fact the last great wild

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(1) salmon fishery in the world and it supports an awful lot of
 (2) families and those families were devastated by the spill and
 (3) we are here to ask you to hold Exxon to the promise they made
 (4) They made the promise to you to them and the promise was to
 (5) fully compensate these fishermen
 (6) Now His Honor instructed you that damages cannot be
 (7) speculative and that's right that's right because that's what
 (8) he instructed you sort of a self-proving kind of thing And
 (9) he went onto say - they call that the 600 pound gorilla
 (10) rule moving right along and then he followed up that
 (11) particular sentence and I wrote it down that there needs to
 (12) be some reasonable basis for determining the fact of the loss
 (13) of income and the law recognizes also that in going back and
 (14) trying to figure out exactly what would have happened because
 (15) of the spill we need to use some approximations and that's what
 (16) we are going to do
 (17) I am not going to come in here and precisely tell you what
 (18) the price was and what the exact numbers of fish were because
 (19) nobody can do that because we don't know because of the
 (20) spill
 (21) but we will show you that the damage occurred and we will
 (22) provide you with the tools to estimate the amount of that
 (23) damage and the damages include salmon harvests in Prince
 (24) William Sound for five years
 (25) There was a five year impact in Prince William Sound and
 (26) the number will be 86 million dollars Upper Cook Inlet

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(1) impacts for three years 166 million dollars Kodiak impacts
 (2) for three years 62 million dollars Chignik impacts for three
 (3) years 22 million dollars Herring for all of these areas 41
 (4) million dollars Fish price to all species for 1989 134
 (5) million dollars To all species in 1990 174 million dollars
 (6) To all species in 1991 244 million dollars Lost herring
 (7) harvests of 26 million dollars Damages to permits of 23
 (8) million dollars for a total of 978 million dollars 978
 (9) million dollars almost a billion dollars But keep in mind
 (10) that there is 10,000 fishermen in an area the size of a number
 (11) of states and the last great wild salmon fishery in the world
 (12) and that these numbers and you'll see and we'll build the
 (13) numbers block by block just like we proved Phase I brick by
 (14) brick block by block
 (15) Sit there pay attention to the concepts behind the numbers
 (16) and you'll see that these numbers are the best estimates that
 (17) any of us could bring to these problems
 (18) Now Exxon will come in despite the promise it made at the
 (19) beginning of the case and they will say it is a coincidence
 (20) that salmon prices dropped after the spill It is a
 (21) coincidence that herring prices dropped after the spill It is
 (22) a coincidence that permits dropped after the spill It is a
 (23) coincidence that herring come back with lesions on them after
 (24) the spill It is a coincidence that Kodiak and Chignik and
 (25) Upper Cook Inlet reds collapsed five years the life cycle of

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(1) red salmon five years after the spill It is a coincidence in
 (2) 1992 and 1993 - 93 and 94 pink salmon collapsed in Prince
 (3) William Sound after the spill This whole complicated
 (4) personal economic biological unit every aspect of it that is
 (5) important to those people every single aspect of it that is
 (6) important to those people have collapsed and in 1988 this was
 (7) economically and biologically the healthiest fishery in the
 (8) world No holds barred Happy families a lot of fish good
 (9) prices good future good markets and in 1989 the spill
 (10) happens and as we sit here today we've lost fish we've lost
 (11) price we've lost permit value we've lost the economic
 (12) vitality of these 3300 small businesses we've impacted the
 (13) livelihoods of 10,000 fishers men and women people who
 (14) chose
 (15) this place in the world and this particular life style to get
 (16) away from the Exxon's in the world
 (17) But we'll hear - for every item of damage we'll hear an
 (18) excuse But I would submit this proposition to you and I'm
 (19) going to finish early I would submit this proposition to you
 (20) oil and fish don't mix That's where I started and that's
 (21) where I'm going to end You cannot manage a fishery that's got
 (22) oil in it You shouldn't harvest fish from an oiled fishery
 (23) and put them into a market You can't raise a family on a
 (24) fishing income in an oiled fishery Fish don't thrive in an
 (25) oiled fishery You can't sell a permit from an oiled fishery
 (26) We're going to prove those things just like we proved Phase I

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(1) brick by brick block by block with what we think are some of
 (2) the finest biologists and economists in the world Thank you
 (3) THE COURT Mr Lynch
 (4) MR LYNCH Ladies and gentlemen of the jury my job
 (5) here a month and a half later is to do again what I tried to do
 (6) at the beginning of Phase I and that s to give you a preview
 (7) of the evidence that Exxon will be presenting in this phase of
 (8) the case
 (9) It s a lot more foreboding challenge this time than it was
 (10) last time because naturally you can imagine that it is not easy
 (11) to stand before you after you returned a verdict a week ago
 (12) against us which I m sure you can appreciate was a very
 (13) disappointing outcome for us and you can see that it would
 (14) naturally raise a concern that you would be less receptive to
 (15) what we have to say in this phase of the case having determined
 (16) that you didn t agree with our evidence in the first phase of
 (17) the case and that s I guess the first psychological
 (18) challenge that we have to face in this trial
 (19) This is not a unique experience because every lawyer in the
 (20) trial of every case has almost always situations in which the
 (21) judge rules against us on some point and we have to come
 (22) back
 (23) into court on the same case before the same judge and argue
 (24) the
 (25) next point and we have to learn to believe and trust and
 (26) generally speaking our belief and trust is justify that judges
 (27) will keep an open mind will decide each issue on the evidence

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(1) and the merits of that issue and will not allow one feelings
 (2) or reactions to one to spill over into the next
 (3) You as the judges of the fact have ruled against us to our
 (4) disappointment but that is your verdict and that s the way the
 (5) system works and now we are onto a very very different subject
 (6) now And on this subject matter as we said on the first day
 (7) of the trial and as we will say again today we agree with the
 (8) plaintiffs that the Exxon Valdez oil spill was a tragic event
 (9) and that it was bound to have adverse effect on Mr O Neill s
 (10) clients the fishermen of Prince William Sound Cook Inlet
 (11) Chignik and Kodiak
 (12) Exxon regardless of the question of fault regardless of
 (13) what we think the story of that accident is Exxon has always
 (14) recognized that it was our ship and our oil and we should be
 (15) responsible to pay the damages that result from that spill
 (16) we ve always recognized that The fact that we didn t agree
 (17) with the plaintiffs on the extent of fault does not mean that
 (18) anyone at Exxon was any less sorry that some aspect of its
 (19) business caused injury to people who are trying to work and
 (20) make their living in another part of Alaska where Exxon also
 (21) goes
 (22) Exxon people were devastated by the spill Mr O Neill
 (23) makes fun of that use that they were upset in their home in
 (24) their own family life that that spill came back and affected
 (25) them but nothing like it affected the fishermen of Prince

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(1) William Sound and western Alaska Exxon reacted to that fact
 (2) immediately by publicly accepting the responsibility and acting
 (3) on that acceptance of the responsibility
 (4) Mr O Neill made reference to permit payments and costs
 (5) daily costs of living and Exxon stepped into that breach
 (6) recognizing that there was bound to be an impact on the fishery
 (7) and set up a claims program that made money available to Mr
 (8) O Neill s clients in 1989 when the fisheries were disrupted so
 (9) that boat payments could be met permit payments could be
 (10) met
 (11) so that people s financial plans would not be disrupted and
 (12) there was as I think anyone in Alaska knows the enormous
 (13) economic activity associated with the unprecedented clean up
 (14) effort in Prince William Sound so that for fishermen and
 (15) people that worked for fishermen there were employment
 (16) opportunities to substitute for fishing which also contributed
 (17) to some sort of an economic band aid
 (18) No one is trying to minimize the impact of the spill no
 (19) one is here to say that fishermen are not entitled to their day
 (20) in court but as Your Honor instructed you the questions which
 (21) you ll be asked to decide the questions which Mr O Neill
 (22) brought out to you the questions are what fish run size would
 (23) have been and what the price would have been And the
 (24) question of whether the net of that is a balance for the
 (25) fishermen or not for the fishermen in 1989 that will be taken
 (26) care of the court because the claims payments have been
 (27) made

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(1) and you will determine what the right amount was and whether
 (2) the claims program hit that on the head or short or whether
 (3) it s over that s between the court and the fishermen and
 (4) Exxon that s not an issue that you as judges of the fact will
 (5) be asked to decide
 (6) The question you will be asked to decide as Mr O Neill
 (7) said and I agree relate to questions of fish management
 (8) questions of biology questions of chemistry and the effort
 (9) will be on both sides of the equation to reconstruct what
 (10) would have happened if there would have been no oil spill
 (11) Now let me say that if you start from the premise which Mr
 (12) O Neill seems to have started from that because Exxon
 (13) accepted
 (14) responsibility for the spill then any figure that Mr O Neill
 (15) or his clients believe is appropriate is something that Exxon
 (16) should pay no questions asked Then we are - we have a
 (17) difference of opinion that s really why this trial is coming
 (18) about because Exxon looked at this situation and felt that the
 (19) fishermen should be fully compensated but as Judge Holland
 (20) also said and I m sure Mr O Neill would agree as well as he
 (21) agreed with the other self fulfilling rules from the court the
 (22) fishermen are entitled to be fully compensated but they are
 (23) not entitled to make a profit from the oil spill They are not
 (24) entitled to be better off than they would have been had there
 (25) been no oil spill
 (26) Mr O Neill referred to the fact that the sun was shining

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(1) in 1988 but the plaintiffs case in this trial the plaintiffs
 (2) would ask you to conclude that 1989 would have been an even
 (3) significantly better year and that if you looked at the
 (4) average of the income that fishermen in Prince William Sound
 (5) and Cook Inlet were making if you look at the average that
 (6) these fishermen were making five years prior to the spill in
 (7) 1989 they would have made two and a half times as much as
 they
 (8) had previously been making they would not only be able to
 make
 (9) their boat payments and permit payments and whatever else
 but
 (10) they would have become very very wealthy on those
 investments
 (11) because they would have been doing far far better than they
 (12) had ever done in the past even in years which according to
 (13) plaintiffs was years when the sun was shining
 (14) Exxon s approach to the question of making the fishermen
 (15) whole has been to take the numbers that the Alaska Department
 (16) of Fish & Game in its regular every day business activities
 (17) carries out as a part of its duty under Alaska law to determine
 (18) the health of the fisheries it s taken the run size numbers
 (19) that the Alaska Department of Fish & Game has generated
 hasn t
 (20) argued with those numbers hasn t tried to juggle them hasn t
 (21) tried to recast them and it s taken the price that the market
 (22) has paid for the fish in 1989 and thereafter and it s
 (23) multiplied those things together to determine in its view
 (24) what Alaska fishermen would have made if there had been no
 oil
 (25) spill that s really the part of the difference between us and

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(1) the plaintiffs
 (2) Now Mr O Neill said to you and in this respect we totally
 (3) agree that this - this map and this map are really one and
 (4) the same The map on the screen shows you the boundaries of
 (5) the ADF&G fishing areas that we will be talking about in this
 (6) Phase II of the trial That it is not overlaid on the larger
 (7) map that the plaintiffs used but we re talking about the same
 (8) geographic area
 (9) Mr O Neill said of this area crude oil and fish don t
 (10) mix and we agree they don t and they didn t And the reason
 (11) is that by and large fish and particularly these fish live
 (12) under water and oil floats on top of water and the oil which
 (13) you saw in the plaintiff s video that was spread over this
 (14) water by this accident and that caused there is no question
 (15) enormous disruption in the 1988 fishing season
 (16) That oil is carried by the natural currents of Prince
 (17) William Sound the natural currents in the Gulf of Alaska out
 (18) into the Pacific Ocean a significant part of that oil is
 (19) flushed out of the Sound the Sound empties refills and
 (20) empties every three weeks So the oil that was on top of the
 (21) water floated away Much of it a portion of it landed on
 (22) beaches as you know and I m sure you ve all seen pictures of
 (23) the beaches being cleaned Some of you may have been down
 (24) there some of you may have known people that were down
 there
 (25) Not all of the oil went out to sea some of it landed on

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(1) beaches but even there the effect of the oil from this spill
 (2) on the water was not a polluting event The impact of crude
 (3) oil on the water is measurable but the measurements of
 (4) chemicals coming out of the crude from the Exxon Valdez into
 (5) the water where the fish live which were made extensively in
 (6) hundreds and hundreds of samples taken not only by Exxon
 but
 (7) taken by the federal government and by the state government
 (8) those measurements never showed petrochemicals in
 quantities
 (9) that could hurt fish
 (10) Now I say never I ve got to correct myself Yes you can
 (11) find isolated examples out of thousands of tests there were
 (12) one or two examples or several examples in various places for
 (13) a short time where chemical levels peak a little bit above
 (14) what s considered safe but across the board in this huge body
 (15) of water which Mr O Neill mentioned to you covers an area of
 (16) several states they could not find concentration of chemicals
 (17) from the oil that would be harmful to fish So the water where
 (18) the fish live that water remained pure thank goodness that s
 (19) just one of the aspects of nature and the aspects of science
 (20) that made this spill a little less worse than you might think
 (21) it would have been if you just see the pictures of the oil on
 (22) top of the water That - millions of fish who live beneath
 (23) that water were not exposed to the oil
 (24) Now along the shorelines which Mr O Neill made reference
 (25) to what he called the - the sea land margin I think what

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(1) scientists call the intertidal zone oil did go ashore it did
 (2) go ashore following the path that the plaintiffs indicated to
 (3) you generally along this area in the south and west of Prince
 (4) William Sound and then in much smaller quantities down along
 (5) the Kenai Peninsula Kodiak and into Chignik
 (6) However as a part of its acceptance of responsibility for
 (7) this spill Exxon undertook the most extensive and most
 (8) expensive clean up anywhere in history to clean up and
 remove
 (9) as much oil as could be removed in as short a time
 (10) This is a picture of oil on Green Island Green Island
 (11) you can barely see it on this map You can t even see it on
 (12) this map but it s a little island right up in here and it was
 (13) one of the most heavily oiled sites in the month following the
 (14) spill What you see is a beach facing up toward Bligh Reef
 (15) and there is crude oil all over that beach pools of crude oil
 (16) and that is a significantly impacted beach not every beach was
 (17) like that if you looked at a percentage of the entire
 (18) shoreline of Prince William Sound that would be an unusual
 (19) situation That s about as bad as it got
 (20) Now by 1991 this same beach looked like this That s a
 (21) picture of the same beach taken from basically the same
 (22) position as the last picture but in the meantime Exxon has
 (23) cleaned that beach and even more significantly nature has
 (24) helped to clean that beach Storms that naturally occur cause
 (25) the oil that had stranded on the shore to be washed out Exxon

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(1) cleaned off the beach and siphoned up the oil so that by 1991
 (2) two years after the spill this beach is essentially restored
 (3) to the condition that existed before the spill
 (4) Now if you look at this picture very closely you can see
 (5) little black splotches and the natural reaction if you were
 (6) just a hiker walking along Green Island now you might say
 (7) that's a remnant of the Exxon Valdez oil spill that must be
 (8) crude oil stuck to the rocks and you can be right and you
 (9) could be wrong because the little bugs and plants that Mr
 (10) O Neill was talking about include lichen kind of a mix between
 (11) fungus and plants that grow on the rocks and many times only
 (12) an expert can tell whether the black marks on the rock are
 (13) natural lichen or whether it's crude oil But if it's crude
 (14) oil it's in a state which is totally unavailable to biology
 (15) unless you're a crude oil eating microbe but it doesn't affect
 (16) fish deer higher living things It may be biodegrading in
 (17) the natural process because one of the things that you'll hear
 (18) in the trial crude oil is a natural substance We go see
 (19) organically grown vegetables and something called natural
 (20) always seems to be a good idea but crude oil comes out of the
 (21) ground it's a natural substance it has to come out in paying
 (22) quantities for people to actually drill for it and collect it
 (23) it comes out of the ground in nonpaying quantities in a lot of
 (24) the places in the world including Prince William Sound There
 (25) are seeps of natural crude oil into Prince William Sound and

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(1) into streams in Prince William Sound and there are seeps of
 (2) natural crude oil that have been going on for hundreds of year
 (3) for all anyone can tell in which - I can find a picture
 (4) salmon have been breeding for years with oil floating on top of
 (5) the water It is not impossible for living things to coexist
 (6) with modest quantities of crude oil 11 million gallons
 (7) that's not supposed to happen 11 million gallons that's
 (8) something you have to react to you have to get in there and
 (9) clean it up but trace amounts of crude oil are not something
 (10) that nature has never seen except for an oil spill it doesn't
 (11) have an adverse effect on fish populations
 (12) Part of the story that crude oil and fish don't mix is they
 (13) didn't have to mix Fish were in the water column as if you
 (14) drilled a core down and pulled out a circular piece of water
 (15) and they measured that water column and they determined that
 (16) it
 (17) remained pure The oil when it was there was on the top tiny
 (18) minute traces of the chemical may have dissolved tiny droplets
 (19) may have dispersed but none of those were in quantities or
 (20) concentrations sufficient to cause any extensive fish damage
 (21) And by the way this is not something that in the quote
 (22) excuse that Exxon came up with this isn't the first oil spill
 (23) in history There were oil spills before the Exxon Valdez
 (24) there have been oil spills since I'm sure you all know during
 (25) World War II people on both sides were purposely blowing up
 tankers in the ocean particularly along the east coast of the

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(1) United States millions and millions of gallons of oil spilled
 (2) by tankers that had been torpedoed
 (3) Nowhere in the world has an oil spill resulted in a large
 (4) fish kill as a result of oil getting down into the water and
 (5) poisoning the fish and this spill was no different So Exxon
 (6) was fortunate if you will that nature doesn't make it tough
 (7) for fish in an oil spill It's tough for other kinds of life
 (8) but fish are below the exposure Exxon reacted to minimize to
 (9) the greatest extent humanly possible the impact on nature of
 (10) oil stranding in the land water margin the intertidal area by
 (11) engaging in a clean up and nature helped because the
 (12) environment of Prince William Sound is one which helped to
 (13) promote the clean up Exxon could only help nature along but
 (14) nature did most of the work
 (15) So the fact is that when you look at these fisheries which
 (16) are important and just I think as Mr O Neill described them
 (17) noteworthy natural salmon and herring and other kind of
 (18) fisheries The impact of the spill we believe the evidence
 (19) will show and we will submit to you as judges of the fact the
 (20) impact of the spill was primarily in 1989 when the oil was on
 (21) top of the water and in the way of fishing not because it was
 (22) hurting the fish but because it would hurt fish nets and the
 (23) fishing equipment to try to fish through that curtain of oil
 (24) that fishing had to be disrupted
 (25) Now Exxon as I said recognized that that need was there

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(1) stepped in immediately to try to make funds available to assure
 (2) that in the short run that on a monthly payment basis fishermen
 (3) were not going to be put in a position where they couldn't meet
 (4) their payments where they were suffering a financial problem
 (5) because we had to reconstruct what the fishing would have
 (6) been
 (7) in 1989 and the income that went into that fishing community
 (8) in 1989 was greater than it had been in earlier years
 (9) The cash flow situation there was no immediate financial
 (10) disaster Then the process of trying to determine what would
 (11) have happened went forward and as I said Exxon's position
 (12) was
 (13) that the best way to know what would have happened was to
 (14) look
 (15) at what had happened in the past These were the same
 (16) fisheries these were the same fish stocks these were the same
 (17) fishermen by and large and fisher women so Exxon thought
 (18) let's look at what's been happening over time because that
 (19) would be a pretty good indication of what's happened in the
 (20) past The representatives of the fishing interests they said
 (21) no you're understating although the ADF&G says this would
 (22) have been the run size actually ADF&G is wrong they didn't
 (23) count the fish right or their method of counting the fish is
 (24) inaccurate there was fish there that they didn't see that they
 (25) should have seen
 That was the source of the difference of opinion that we
 bring to you today as judges of the fact and I say to you as
 I said on the first day you are the judges of the fact on this

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(1) issue Exxon Corporation the people at Exxon management
 (2) employees shareholders believe they have been fair believe
 (3) they have taken a fair approach they submit that question to
 (4) this jury and all we ask you to do whatever you thought about
 (5) Phase I is listen to our evidence not take the approach that
 (6) because we've accepted responsibility we're not even entitled
 (7) to a hearing not take the approach because we've accepted
 (8) responsibility anything the fishermen say is necessarily true
 (9) or right not take the approach that because there was an oil
 (10) spill everything that happened to the fishery must be traceable
 (11) to the oil spill automatically not jump to that conclusion
 (12) I think if I weren't working on this case I would probably
 (13) approach it myself I see there is a big oil spill big high
 (14) profile events then events occur afterwards and you say
 (15) well that must be because the oil it wasn't happening before
 (16) must be because of the oil and Mr O'Neill spoke about
 (17) science and that's what science has brought to all of us is
 (18) the thought that you don't jump to the obvious conclusion
 (19) without looking at it carefully and asking yourself and asking
 (20) by experiments and testing and looking into the subject is it
 (21) really true what I guessed at
 (22) For some thousands of years we have all thought the sun
 (23) revolved around the earth and some famous people were put
 (24) to death for claiming otherwise but we know that's not true if I
 (25) told you today that the sun revolved around the earth you

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(1) would say I was crazy Something that science has brought to
 (2) bare on us
 (3) Now looking into this subject both sides have gone to
 (4) scientists and I think it's fair to say that both sides have
 (5) tried to get the opinions of reputable scientists and there
 (6) are difference of opinions among the scientists One of the
 (7) things that you as the judges of the facts will be confronted
 (8) with is how this concept that the law has about the
 (9) preponderance of evidence how that concept is applicable to a
 (10) situation where scientists who have spent their life studying a
 (11) subject can't agree and even a scientist who has an opinion
 (12) can say that's my opinion but it hasn't been proven yet It's
 (13) like - if you studied it in high school or college the
 (14) scientific method you start with a hypothesis and you say I
 (15) think that maybe X is causing Y I think maybe the oil spill is
 (16) causing something to happen Let me set up some
 (17) experiments
 (18) let me set up some tests to see if that in fact is the case
 (19) And you will hear in this phase of the trial about tests and
 (20) about experiments that have been conducted on both sides
 (21) and I
 (22) think you'll conclude when you go away to deliberate that no
 (23) scientist who will come here and testify can say they know to a
 (24) certainty or they have established the level of confidence
 (25) that scientists typically require that they can prove these
 (26) conclusions that have been suggested
 (27) Now let me if I can address one by one the elements of

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(1) damage which we will be talking about Let me say in
 (2) discussing these what I've said already That is that the way
 (3) this phase of the trial has been structured you are asked to
 (4) decide this question on an almost theoretical basis you are
 (5) being asked to decide what would the total number of fish have
 (6) been you're not going to take into account what was paid or
 (7) who was paid you're not really being asked to determine how
 (8) these fishermen were damaged because you're not going to be
 (9) provided and you don't know what they have been paid before
 (10) they came in here today what other income opportunities they
 (11) had What you're being asked to determine just as an abstract
 (12) matter what would have happened had there been no oil spill
 (13) and what would have happened in 1990 and what would have
 (14) happened in '91 and '92
 (15) Now in 1989 after the oil spill and properly and
 (16) understandably so the Alaska Department of Fish & Game
 (17) closed
 (18) these areas which are shown on the screen in Prince William
 (19) Sound And the reason they were closed fundamentally was
 (20) there
 (21) was enough oil in the water that there was a risk that in
 (22) pulling the fish up out of the water and on to the boat they
 (23) would come in contact with crude oil fish would be tainted
 (24) and that could cause a health problem and it could also cause a
 (25) marketing problem if the reputation of Alaska fish was injured
 (26) so the Alaska Department of Fish & Game closed those fisheries
 (27) and there was no commercial fishing allowed in those areas

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(1) Now you would say to yourself well obviously then there
 (2) must have been a lot fewer fish caught in 1989 the fishermen
 (3) must have been at a disadvantage in 1989 as compared to
 (4) earlier
 (5) years because they couldn't fish This is a chart of those
 (6) same areas as they existed in 1988 and the red area means
 (7) exactly the same thing It means that the Alaska Department of
 (8) Fish & Game in 1988 closed those areas of Prince William
 (9) Sound
 (10) to commercial fishing
 (11) Now if you look at the two maps side by side what you'll
 (12) see is there was more of Prince William Sound closed to pink
 (13) salmon fish in 1988 then was closed in 1989 Now there was no
 (14) oil spill in 1988 Why did they close those fisheries in 1988
 (15) and what does that mean about 1989?
 (16) Mr O'Neill made reference to the fact that the Alaska
 (17) Department of Fish & Game is charged by the people of Alaska
 (18) with the job of maintaining healthy fishing stocks for the
 (19) commercial fishermen for the recreational fishermen and for
 (20) our children Part of that job is to assure that an adequate
 (21) number of adult fish are allowed to lay eggs every year so that
 (22) the fish can return and repopulate
 (23) Now long prior to the Exxon Valdez oil spill in Prince
 (24) William Sound we were tinkering with nature because the fish
 (25) population of - pink salmon population I should say of
 (26) Prince William Sound is not predominantly a natural
 (27) population It is predominantly a population of hatchery fish

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(1) which the fish were caught their eggs are scientifically
 (2) removed so almost every egg hatches into a young fish They
 (3) are raised until they are viable living fish then they are
 (4) released at a rate of about 600 million fish a year into Prince
 (5) William Sound And by 1988 hatchery pink salmon represented
 (6) about 75 percent of the total returning population of pink
 (7) salmon and that was a hugely larger population than had
 (8) existed before the hatcheries opened up in the 70s As a
 (9) result of the hatchery process the pink salmon fishery had
 (10) grown enormously the number of pink salmon that could be
 (11) caught by everybody had grown enormously But one
 consequence
 (12) they talk down in Seattle about Californians moving up and
 (13) driving up real estate prices well all the hatchery fish were
 (14) coming in and eating the bugs and the plants and getting
 caught
 (15) by the 3 300 fishermen that were out there with their drift
 (16) nets and seine nets Now the 25 percent of pink salmon that
 (17) were natural the ones that go into the mouths of the 800 or so
 (18) streams that surround Prince William Sound those fish were
 (19) being caught too
 (20) Because they were the minority in that population the
 (21) Alaska Department of Fish & Game was concerned that the
 natural
 (22) fish were going to be wiped out that there wouldn't be enough
 (23) of those fish getting away to get to the streams and keep a
 (24) natural pink salmon population alive so in 1988 the man in
 (25) charge of Prince William Sound closed all of these areas to

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(1) commercial fishing and the reason that he made those closures
 (2) was that he wanted more natural fish to get away to the streams
 (3) all around Prince William Sound so that they could naturally
 (4) lay their eggs the natural stock would survive and instead
 (5) what he did he allowed the commercial fishermen to engage in
 a
 (6) terminal fishery that means they were allowed to fish right
 (7) near the hatchery
 (8) You remember Mr O Neill told you one of the great
 (9) mysteries of science is that the salmon return to the very
 (10) waters where they were born where they were spawned and
 the
 (11) hatchery fish are exactly like that they come right back to
 (12) the front door of the hatchery so the fishermen can wait right
 (13) there by the door that's not their preferred way to fish but
 (14) the overwhelming majority of the fish that arrive at the
 (15) hatchery are going to be hatchery fish and hopefully the
 (16) natural fish will have gotten off at the off ramps and headed
 (17) back to their condos or houses or wherever they were headed
 and
 (18) repopulate naturally
 (19) That's what Mr Brady who was in charge of fishing in 1988
 (20) did The fishing was done at terminal fisheries at hatcheries
 (21) and the catch was measured by what they would catch at the
 (22) hatcheries and Mr Brady will say was because the weak run of
 (23) natural salmon that occurred in 1989 he would have done the
 (24) same thing so the result was that there was an oil spill out
 (25) there and although fishing was closed no doubt about it

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(1) because of oil the same thing would have happened
 (2) Now remember what Mr O Neill said you were here as judges
 (3) of the facts what would have happened had there been no oil
 (4) spill and the man who had that decision to make he says what
 (5) would have happened is there would have been the same
 closures
 (6) and fishing would have occurred in the same places and
 fishing
 (7) did occur and fishermen did harvest pink salmon and so the
 (8) fact is that the fishing that was actually done in 1989 was
 (9) very very very close to the but for world so that's part
 (10) of our difference of opinion with the plaintiffs because the
 (11) plaintiffs would have someone that's going to come in that was
 (12) not part of the decision and say no I don't think that would
 (13) have happened The man whose responsibility was to make
 that
 (14) decision that's what he said and will say
 (15) Now let's talk about the fishery for reds or sockeye salmon
 (16) in Cook Inlet that's another case where the fishery - where
 (17) we disagree with the plaintiffs about the number of fish and
 (18) our disagreement is a little over 1 million fish That dispute
 (19) relates to a claim made after the oil spill that the way that
 (20) ADF&G I say ADF&G the way that ADF&G counts the fish and
 had
 (21) been counting the fish years beforehand that was wrong they
 (22) were missing fish there were actually fish swimming up the
 (23) river that ADF&G didn't know about part of the overescapement
 (24) argument So they are saying the numbers should have been 1
 (25) million higher And you'll hear people say that were involved

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(1) in that program from ADF&G and they will tell you that they
 (2) believe because of the particular characteristics of the river
 (3) that we're talking about the Kenai River that the counter is
 (4) accurate That this additional 1 million fish did not escape
 (5) Now there is a twist on this one because there is no
 (6) dispute on Exxon's side that some additional fish would have
 (7) been caught if there had been no oil spill there was minor
 (8) amounts of oil in Upper Cook Inlet but because of the zero
 (9) tolerance policy and we indeed do not disagree with that
 (10) policy drift net fishermen were not allowed to fish in the
 (11) middle of Upper Cook Inlet out near the Kenai River You saw
 (12) the picture of the drift net fishermen they are like the six
 (13) pack things the fish swim along and the net is hanging down
 (14) and the fish get stuck call them gillnets the fish get stuck
 (15) and are pulled in Driftnet fishermen were not allowed to fish
 (16) in Upper Cook Inlet and they didn't catch the amount of fish
 (17) that they would have normally caught and that's attributable to
 (18) the oil spill no doubt Setnetters also fish and they stick
 (19) their nets away from the shore and the fish as they swim along
 (20) the banks get their gills stuck in the net Setnetters had
 (21) bonanza they caught most of the fish that in a normal year the
 (22) drifters would have caught They didn't get shortchanged at
 (23) all they caught many many more fish if there hadn't been an
 (24) oil spill So the people that owned set net permits in Upper
 (25) Cook Inlet by happenstance in 1989 the oil spill was a great

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(1) benefit
 (2) Now you will have to determine what the run would have
 (3) been and perhaps the jury verdict form will ask you to split
 (4) it between driftnet and set net fishermen but as you move
 (5) forward into the other claims that the setnetters are making
 (6) that s a benefit that they got from the oil spill they did a
 (7) lot better I think the plaintiffs experts will have to agree
 (8) they did a lot better than if there was no oil spill in 1989
 (9) Now the next aspect of the 1989 story is price but for
 (10) world had there been no oil spill Now Mr O Neill has said
 (11) and this is a very reasonable hypothesis to start with Mr
 (12) O Neill has said if there is crude oil in the water of a well
 (13) known fishery and it s a worldwide news event and it
 (14) certainly was believe me no one knew that better than Exxon
 (15) then people would be afraid to buy the fish You probably all
 (16) remember the Alar thing with the red apples maybe you don t
 (17) shop at Jack in the Box as much as you used to but at Exxon
 (18) we
 (19) did not start with the premise that that was a crazy or unfair
 (20) or unreasonable suggestion we tried to look at it
 (21) scientifically We said that s a very reasonable hypothesis
 (22) but does it prove out let s go look at it see if it s true
 (23) and we hired the person we think is the leading expert in the
 (24) field of salmon marketing Dr Anderson University of Rhode
 (25) Island and a number of other people who are involved in
 marketing salmon around the world

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(1) I d like to spend just a few seconds maybe more than a few
 (2) seconds I d like to spend some time talking to you a little
 (3) bit about salmon marketing because it s been a revelation to
 (4) me I ve got to concede that I m not a big fish eater to start
 (5) with but I ve always thought of salmon as special treat kind
 (6) of fish you know the kind of fish that you have to splurge to
 (7) buy at the market And then I learn as we get into this case
 (8) that of course salmon from Alaska are sold in different places
 (9) to different consumers pink salmon which range in price have
 (10) ranged in price from 15 cents to 30 35 cents a pound that
 (11) goes predominantly into cans and I ve been looking around
 (12) Anchorage to find a pink salmon sandwich and no one will sell
 (13) me one We in Alaska don t think pink salmon is worth eating
 (14) so that goes to the Lower 48 and England and Western Europe
 (15) where they make salmon burgers I have a can in my briefcase
 (16) that has a recipe for salmon burgers and it s an inexpensive
 (17) fish goes to like canned tuna that almost always involves a
 (18) low price end use It involves a different kind of taste than
 (19) some of us in the United States think of when you think of
 (20) salmon because I at least in my part of the country tuna is
 (21) the canned fish that most people use the southeast and south
 (22) that canned salmon sells predominantly and England it s a big
 (23) seller
 (24) Sockeye salmon red salmon is the easy salmon to buy in
 (25) Anchorage and when you buy it you get it grilled in either a

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(1) steak or a fillet and it is a premium special fish but as Mr
 (2) O Neill told you the sockeye salmon that supports the
 (3) fishermen who are the plaintiffs here the big sales the sales
 (4) that count those are sales in Japan and I was surprised to
 (5) learn that in Japan sockeye salmon isn t quite on the status
 (6) that pink salmon is in Alaska but it s not thought of as the
 (7) big succulent special Sunday dinner fish it s the every day
 (8) sort of Spam of fish it s the fish that people in Japan eat
 (9) for breakfast lunch and if they are going to have special
 (10) company for dinner they don t look at salmon at least they
 (11) haven t historically if it s going to be a special treat they
 (12) look at farmed Atlantic salmon as something special because
 (13) they aren t used to it Salmon in Alaska is sold salted fresh
 (14) is not as big a deal in Japan as it is in the United States so
 (15) the market that these fish go to is a little different than
 (16) we re talking about here it s a little different than the
 (17) market you might think of when you think about the news of the
 (18) oil spill causing people to shy away from fresh fish When I
 (19) first heard about this that s my image fish on ice
 (20) concurrently with the oil spill people saying maybe I won t
 (21) buy salmon
 (22) Our expert looked into this and he found some surprising
 (23) thing things that didn t fit the hypothesis one of the things
 (24) he found was Alaska salmon sales rose didn t fall at the time
 (25) of the oil spill That s not what you would expect to happen

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(1) and people shying away When people were concerned about
 (2) red
 (3) apples with Alar they weren t moving green apples were
 (4) moving but salmon from Alaska sold better not worse and
 (5) when
 (6) you looked into the market particularly in Japan and asked
 (7) people and checked into it and said why is there this
 (8) concern they couldn t find any evidence that buyers were
 (9) steering away from Alaska salmon because of taint or fear that
 (10) there was oil And since as we know salmon is a staple
 (11) something that people like to expect to eat all the time
 (12) Now you would say if there is question about Alaska salmon
 (13) then this must be a good time to be selling Canadian salmon or
 (14) Chilean or Japanese go to your customer and say not to worry
 (15) this salmon didn t come from a place where the oil spill
 (16) occurred but when you look at those salmon fisheries and
 (17) those
 (18) salmon markets they didn t have a bonanza either they had a
 (19) year of falling prices and if you look further into this you
 (20) see even in Alaska experts who were studying the market were
 (21) saying that the salmon market has peaked the salmon market
 (22) is
 (23) bound to decline because prices have gotten unrealistically
 (24) high and there is a lot more salmon available than there used
 (25) to be not only farmed salmon farmed salmon is an important
 factor hatchery raised pink salmon are an important factor in
 the supply of pink salmon but they re having huge harvests of
 salmon in other parts of the world and if you look more deeply
 into it you see the people who bought sockeye salmon at 2 50 a

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- (1) pound were sort of stuck with it in the beginning of 1989
 (2) remember salted not fresh they had supplies of salmon on
 (3) their hands that they had paid a high price for and the market
 (4) price was falling down so they were anxious to sell off their
 (5) inventory they weren't as anxious as they might be in a time
 (6) of short supply to go out and buy replacement salmon so
 (7) everybody's price for salmon was falling in 1989 not just
 (8) these fishermen the fishermen in British Columbia the
 (9) fishermen in Washington State the people who raise salmon in
 (10) Columbia - rather in Chile and Western Europe salmon prices
 (11) were falling across the board not just salmon but tuna
 (12) remember Mr O Neill said maybe they will buy tuna tuna was
 (13) falling fish prices were falling at that time
 (14) Your Honor would this be a good time?
 (15) THE COURT Take our first recess reconvene in 15
 (16) minutes
 (17) (Jury out at 10 00 a m)
 (18) (Recess at 10 00 a m)
 (19) (Jury in at 10 15 a m)
 (20) THE CLERK All rise
 (21) MR LYNCH At the break I asked what I had forgotten
 (22) and first thing I was told I forgot was to introduce Bert
 (23) Cooper who like at the plaintiffs table will be helping us
 (24) He likes fish and he is a commercial fisherman and he knows a
 (25) lot about the fishing issues

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- (1) I have up to now covered basically in a very general way
 (2) the story of 1989 as we believe the evidence will convey it to
 (3) you as judges of the fact I want to say again we believe
 (4) that the consequences of the oil spill are not as great as the
 (5) plaintiffs say they were
 (6) We believe that if you listen to the evidence you will be
 (7) convinced that is true more probably true than not but one of
 (8) the good things one of the few good things about this spill is
 (9) that it was Exxon's oil and they are able to make good on the
 (10) statement that we mean to pay what is fair here Fair to the
 (11) plaintiffs fair to Exxon what the right number is as best
 (12) you can come to it If you disagree with us on this point or
 (13) if you come down somewhere in the middle whatever that's the
 (14) issue we are asking you to decide when we ask you to give us a
 (15) fair chance to hear our evidence we try to be fair about this
 (16) subject we mean to be fair about this subject and you as the
 (17) jurors judges of the facts if you could just listen to our
 (18) evidence and have an open mind about it we believe it's
 (19) convincing
 (20) Now like Mr O Neill I have focused on the biggest
 (21) elements of 1989 There are actually five areas there are as
 (22) many as six species in those areas so that's 30 potential
 (23) run - I think the real number is 22 potential run size and
 (24) price issues that you'll be called upon to decide I haven't
 (25) summarized all that evidence nor has counsel you'll be

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- (1) hearing a lot more about it than I have summarized But moving
 (2) past 1989 the first subject I'd like to deal with is price in
 (3) 1990 and 1991 what the evidence will show on that subject
 (4) We've discussed price in 1989 we've discussed this
 (5) question of taint and what the evidence we believe shows about
 (6) the perhaps surprising factor because of the nature of the
 (7) market because of the things that the State of Alaska did
 (8) because of the kind of demand that exists elsewhere in the
 (9) world for salmon and the way it's sold the concern that you
 (10) would expect or might expect to happen didn't materialize and
 (11) that actually Alaska salmon prices behaved very much like fish
 (12) prices all around the world but what you wouldn't expect if
 (13) there was a taint problem you wouldn't expect the fear of the
 (14) fish to grow more the year after the spill than it had been the
 (15) year of the spill and even more the second year after the
 (16) spill than it had been the year of the spill and that's really
 (17) what the plaintiffs' prize witness has to conclude because he
 (18) shows price rising while everybody else is falling in 1990 and
 (19) '91 if there had been no oil spill He postulates a world in
 (20) which the price of Alaska fish from these fisheries and only
 (21) these fisheries would have been rising when the price for
 (22) comparable competitive fish was falling all over the world and
 (23) he said that's because people were afraid of Alaska salmon
 (24) even
 (25) though by 1990 the clean up had been completed or at least the
 first major phase of the clean up had been completed the news

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- (1) had died down the sense that there was a major oil spill out
 (2) there had died down and we believed that just isn't reasonable
 (3) and it doesn't bare up
 (4) Actually turns out to be the case is that this mathematical
 (5) model that you heard about I don't know if any of you play
 (6) computer games but there are computer simulation games like
 (7) Sim City (ph) and so forth and you get to take a position and
 (8) try to build a perfect world or fly a spaceship or in my case
 (9) fight the battle of Gettysburg And if you play it right the
 (10) south can win the battle of Gettysburg you can create a
 (11) simulation to show those results The simulation that shows
 (12) those prices rising is based on a premise that the more farmed
 (13) salmon that is sold the bigger the impact of farmed salmon
 (14) then the higher the prices of salmon will rise just go to your
 (15) market and at the start of the season when grapes or peaches
 (16) are coming in you see that the prices are high but at the
 (17) peak of the crop arriving and there are a lot of grapes and a
 (18) lot of peaches they fall sometimes very low become
 (19) bargains
 (20) As farmed salmon became more involved in the market in '90
 (21) and '91 you would expect the prices to fall but this
 (22) simulation shows them rising and we believe that's not
 (23) reasonable ask - and while Exxon has committed to pay what's
 (24) fair we don't believe a price claim based on that premise is
 (25) fair we don't believe if there wouldn't have been an oil spill

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(1) prices would have behaved that way we can't see the connection
 (2) between the claims. When we go beyond the price claims in 1990
 (3) and 1991 we get into what Mr. O'Neill has talked about at
 (4) least he wasn't using it in this context. The great mysteries
 (5) of science. We are talking about speculation on the part of
 (6) scientists to find some tenuous connection to connect an oil
 (7) spill in 1989 with problems that show up in fisheries one, two
 (8) sometimes three generations later. The fish that were in
 (9) Prince William Sound in 1989 especially the pink salmon came
 (10) back in record numbers. Healthy strong fish runs. Then in
 (11) 1993 a problem showed up and there is no denying that that
 (12) was
 (13) a problem and there is no denying in our view that that was -
 (14) that that is bound to have an impact on the people who fish for
 (15) a living in Prince William Sound fish for pink salmon bound
 (16) to have an impact on people who fish for herring. There is no
 (17) question here that people who are suing have been hit by
 (18) problems in their fishery.
 (19) Mr. O'Neill referred to the fact like farms you take
 (20) certain risks with nature when you're in the business of
 (21) fishing. The risk that the fish won't come back you take
 (22) certain risks with the marketplace. Somebody else's fish will
 (23) come in big numbers and the prices will fall.
 (24) The biology part of the case the attempt to stretch the
 (25) effects of the oil spill beyond 1989 beyond 1990 beyond 1991
 into '92 '93 and '94 and even later those involve scientific

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(1) speculation. You remember that the instruction that Mr.
 (2) O'Neill focused on said damages can't be speculative
 (3) damages
 (4) can't be based on speculation. Because of the nature of
 (5) science we don't say scientists don't say this is impossible
 (6) unless empirical experimental evidence has shown that. Any
 (7) hypothesis is entitled to some consideration as a possibility
 (8) as an idea but that isn't a proven fact.
 (9) Now in order to connect the undeniable problems that exist
 (10) in Prince William Sound with the oil spill plaintiffs will
 (11) present to you evidence that attempts to relate the contact of
 (12) fish eggs or young fish with oil to problems that show up one
 (13) or two generations later. Now think about that that isn't a
 (14) hypothesis that immediately sounds like it couldn't happen. We
 (15) are all acquainted with the fact that sometimes subtle effects
 (16) take awhile to show up and then problems develop that's
 (17) happened. It's been proven to happen with various kinds of
 (18) biological processes but let's go back to that pink salmon
 (19) population of Prince William Sound. 75 percent of it was
 (20) raised in hatcheries. 75 percent of it was raised in areas
 (21) which never saw oil from the Exxon Valdez spill. Those areas
 (22) were boomed off and oil could not get in there. Those fish
 (23) were raised until they were ready to be released and they were
 (24) released by the hatcheries at a time when they were not at
 (25) risk. That was the bulk of the - overwhelming bulk of the
 pink salmon in Prince William Sound. So it's hard to imagine

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(1) that oil could have had an impact on those millions and
 (2) millions of fish. Then we had you remember the wild pink
 (3) salmon stock which breed right where the fresh water begins to
 (4) turn blackish right at the very ends of the streams there are
 (5) 800 streams right around Prince William Sound. The oil spill
 (6) occurred down here.
 (7) This part of the Sound up here never saw oil. Fish that
 (8) bred up in those areas and had represented again of the 25
 (9) percent of the fish that were wild the overwhelming majority
 (10) went to streams and spawned in streams that had no oil at or
 (11) near them. Only a small small percentage of the pink salmon
 (12) ever saw or their eggs ever saw or were near oil. And so the
 (13) contention that oil could have caused major population wide
 (14) consequences is a hard one to connect up. It's a hard one to
 (15) take that hypothesis and establish - to try to do that. Our
 (16) experts have done experiments and they have produced some
 (17) results interesting results showing that fish that were raised
 (18) in oiled areas or eggs that were laid in oiled areas die
 (19) sooner than eggs that weren't raised in oiled areas that more
 (20) of them die before they produce viable living fish.
 (21) But what those experiments go onto show if you follow them
 (22) through is that the total number of fish in oiled areas that
 (23) go out to sea is not reduced because there are a lot of things
 (24) that happen in nature. Many more eggs are laid that don't end
 (25) up being fish otherwise we would have an overpopulation of

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(1) pink salmon. So it doesn't produce lower numbers of fish going
 (2) out into the ocean.
 (3) Similarly with herring which also have problems the
 (4) contention will be that somehow survey a small number of the
 (5) herring that were raised or that were - eggs that were laid
 (6) and became herring in 1989 caused the whole population
 (7) millions of fish they measure herring by tons of biomass
 (8) because they can't count the individual fish expected to be
 (9) 134 million tons of herring swimming around in 1993. Now
 (10) herring are unusual fish they live for seven years or more
 (11) about seven years. They produce eggs from the fourth to the
 (12) seven or eighth year unlike salmon which produce eggs and
 (13) then
 (14) die. Herring lay eggs year in and year out. Maybe I'm the only
 (15) person old enough to remember the Vic Tanny commercials
 (16) where
 (17) the guy is kicking sand in the skinny guy's eyes and if you
 (18) send in money you can get the product every fourth year there
 (19) is a class of big bullies and they represent the heart of the
 (20) herring population those are the guys who for their life
 (21) span are the principal contributors to the herring
 (22) population.
 (23) I've been told not to go so long on this but I do get
 (24) interested in it it's a fault I have but the big guys in the
 (25) herring population in Prince William Sound there will be no
 dispute about it were the year class of 1984 and then four
 years later the year class of 1988 those were the herring

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(1) members of this 134 ton biomass that were going to be mainly
 (2) responsible for the next generations of herring and of course
 (3) the 84 class was born long before there was an oil spill and
 (4) the 88 class was born the year before the oil spill and
 (5) that's where the large impacts on the herring population could
 (6) occur. The 1989 class was going to get the sand kicked in
 (7) their face they were going to be a small contributor five
 (8) percent to the herring population. So it's very hard
 (9) biologically to make a scientific connection to the oil to a
 (10) large drop in herring population.
 (11) Now what could have caused these undeniable things what
 (12) other hypotheses need to be looked at. Well the evidence will
 (13) be that the trustees who are trying to understand the biology
 (14) in Prince William Sound have asked people to study this have
 (15) offered people to study this and come up with answers to this
 (16) but one of the things that we do know is that men had been
 (17) fooling around with mother nature in Prince William Sound well
 (18) before the spill in that they were putting out millions and
 (19) millions of artificially raised and artificially protected pink
 (20) salmon and all those millions of little pink salmon were
 (21) eating their share of the little guys the little phytols and
 (22) as they got out into the ocean eating their share of the food
 (23) that's available out in the ocean on which these populations of
 (24) fish lived and you know if you follow any kind of population
 (25) even human beings that if you have overpopulation for a - or

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(1) a limited supply of food that what happens is starvation
 (2) starts to occur and with starvation animals in that herd
 (3) school of fish whatever can die out
 (4) So one of the things that the evidence will show is some
 (5) pretty strong suggestions maybe that's what happened here is
 (6) that the fishery was driven too hard. There were too many fish
 (7) allowed into that fishery as a result of the farming or not
 (8) farming ranging of pink salmon the growth of pink salmon
 (9) eggs
 (10) and the release of large numbers of pink salmon. What we do
 (11) know when we get all down to it it's very hard to make a
 (12) scientifically supportable connection of oil to impact on more
 (13) than a small small percentage of fish whether it be pink
 (14) salmon whether it be herring that were in Prince William
 (15) Sound
 (16) Now when we go to the reds or the sockeye in Upper Cook
 (17) Inlet we have a different problem and the question is we
 (18) don't know there is going to be a failure of that fishery
 (19) There is some people who speculate that will happen and what
 (20) they think happened is this. They think that in 1989 when
 (21) they didn't let the driftnet fishermen fish but did let the
 (22) set net fishermen fish too many fish swam up to the lakes and
 (23) that as a result just like what I was talking about in Prince
 (24) William Sound too many little junior sockeye were born and
 (25) during the two years they were in the lake they basically ate
 more than the lake could support they ate more food than they

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(1) could support large family on a short budget everybody gets
 (2) smaller portions grow up not as big and strong go out to the
 (3) ocean. They may not survive that's the contention
 (4) Now that contention has not been proven and there are a
 (5) lot of scientific questions about that. Hasn't - no one is
 (6) able to say what the problem is that has led to - if it's
 (7) happened to fewer sockeye salmon coming down the Kenai
 River
 (8) little sockeye salmon but one thing we do know is that the
 (9) ADF&G that's its job to determine what's the right number of
 (10) salmon to go up that river. Exxon can't no matter how much it
 (11) might like to can't make that decision. Exxon could do
 (12) whatever it wanted after the spill but ADF&G was charged by
 (13) law with the responsibility to maximize that fishery for the
 (14) benefit of commercial fishermen recreational fishermen and the
 (15) future. They decide what's the right spread and in 1989 their
 (16) decision was to let fish escape up that river in part because
 (17) there were other kinds of salmon remember that Mr. Brady's
 (18) in Prince William Sound that closed the salmon fishery to let
 (19) the wild pink salmon get back to their streams
 (20) Well in 1989 on the Kenai River the man in charge there
 (21) was concerned that if he intercepted sockeye salmon coming
 up
 (22) the river he might reduce the king salmon and recreational
 (23) salmon fishermen are interested in catching big king salmon
 (24) So there was a decision made by government that they should
 let
 (25) these fish go up the river. They were doing an experiment

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(1) they were going to see how well these lakes systems and river
 (2) could support a larger escapement. So those government
 (3) decisions those trade offs that government made with the
 (4) recreational interests being sure there were a lot of kings or
 (5) the commercial being sure there were a lot of sockeye we
 (6) believe that that choice was not caused by the oil spill. The
 (7) situation that made it possible that extra fish would swim up
 (8) the river that was created by the oil spill no doubt about
 (9) it. But everyone knew how to stop those fish there were ways
 (10) to cut back on the escapement
 (11) Government made the decision this was the right way to do
 (12) it. They made a policy decision which we couldn't control as
 (13) to how that should be done
 (14) So to sum that up it really isn't clear that there was a
 (15) problem and if there was a problem what caused it but if it
 (16) came from too many fish swimming up the Kenai River in 1989
 (17) that was a decision that the Department of Fish & Game made
 (18) not Exxon and it was a decision that they made knowing about
 (19) and plenty of chance to cause that not to happen and you
 (20) know that again will be a decision for you to decide whether
 (21) that's fairly attributable to the Exxon Valdez oil spill or
 (22) whether it was attributable to a choice that the people in
 (23) ADF&G made thinking in all good faith that it was in the best
 (24) interests of everybody to do that thinking that this gave them
 (25) a chance to perhaps improve the system

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(1) Now Mr O Neill closed on the subject of boat permits and
 (2) said in words or substance you can't sell a permit from an
 (3) oiled fishery Well the evidence on the permits that you'll
 (4) hear that will be a little different than the fishing because
 (5) we've got to talk about permit by permit each fishermen who
 (6) sold his permit has his own set of facts If you sell your
 (7) house somebody over the next town sells their house and
 (8) somebody up here in Anchorage sells their house each of
 those
 (9) transactions has its own particular set of reasons
 (10) motivations trade offs, that cause you to bargain for the
 (11) transaction that you made but at the heart of it is the claim
 (12) that these declines in permit value are attributable to the
 (13) fact that there was an oil spill in 1989
 (14) Well you would expect if that were true that in 1990
 (15) right after the oil spill that would be the worst time to sell
 (16) a fishing permit because that would be the time when if
 (17) anybody buying a fishing permit would have been aware and
 (18) concerned about the effect of the oil spill right during and
 (19) after the spill but that's not when the prices got hurt
 (20) that's actually when prices rose of fishing permits after the
 (21) oil spill
 (22) So the plaintiffs who are claiming that they sold their
 (23) permits for less than they should have received they are
 (24) claiming that the decline in prices that occurred in 1992 and
 (25) 1993 those declines related back to an oil spill that occurred

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(1) two three four years earlier and during that time as you
 (2) will hear from the other evidence fishing around the world
 (3) the fishing business and fishermen around the world have
 been
 (4) on hard times the sun has not been shining Fisheries all
 (5) over the world have been confronted with lowering prices
 (6) declining prices They have been confronted with more supply
 (7) than they would like to have natural supply and farm supply
 (8) and it's going to be your task as finders of the fact to
 (9) determine if these declines in prices that occurred long after
 (10) the oil spill if those declines are really the result of the
 (11) oil spill or if it isn't the fact that when you're in a
 (12) business that has falling prices which has oversupply all over
 (13) the world if in that business you won't expect problems to
 (14) occur And no doubt about it that the biological problems
 (15) that are showing up in Prince William Sound those have got to
 (16) have an adverse effect on permits the question is can you
 (17) really find a basis to conclude more probably than not that
 (18) those came from the oil spill or are they a result of the
 (19) biological risks that are inherent in nature and may be caused
 (20) a little bit more by the decisions that people made to try to
 (21) improve on mother nature either by raising pink salmon or
 (22) trying to see if maybe you can get a few more salmon out of the
 (23) Kenai River by making management decisions
 (24) I'm going to conclude and I think that the message that I
 (25) leave with you is what I started with We stand by our

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(1) commitment which we made before We had no idea what the
 (2) result would be in Phase I
 (3) We want to submit to you our side of the story about what
 (4) would have happened if there had been no Exxon Valdez oil
 (5) spill and your judgment on that will resolve a commitment that
 (6) we made that Exxon made in 1989 and that it has never
 backed
 (7) away from and it does not now back away from It does not
 mean
 (8) that we accept every statement that the plaintiffs make about
 (9) how the oil spill hurt them it does not mean that we do not
 (10) dispute what is fair we do dispute that We will present you
 (11) in good faith what we think the true facts are and you will
 (12) have to make that decision but the decision you make is one
 (13) that - you know Mr O Neill made the statement the Judge
 (14) said it so it must be true because he's the 800 pound gorilla
 (15) but when you make the decision you're the 900 pound gorilla
 (16) When you make a decision on fact we have no other place to
 go
 (17) it's a very rare and narrow case when we challenge a finding of
 (18) fact from the jury
 (19) We will present that evidence to you we ask you to be fair
 (20) to the fishermen because we want to be fair to the fishermen
 (21) We ask you also to be fair to Exxon and we appreciate your
 (22) continued service on the case
 (23) THE COURT Mr Russo
 (24) MR RUSSO Thank you Judge ladies and gentlemen
 (25) Good morning I just want to remind you that my name is Tom

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(1) Russo and as you know together with Mike Chalos we
 represent
 (2) Joseph Hazelwood in this case
 (3) As Judge Holland has told you as a result of your verdict
 (4) Captain Hazelwood is still an individual defendant in this
 (5) case and he is still going to be affected by your decisions in
 (6) the remaining phases of this case Needless to say Captain
 (7) Hazelwood does not have 978 million dollars Maybe that's
 why
 (8) I only have 5 minutes in this opening but despite the fact
 (9) that he's not a rich man but he still is an individual who is
 (10) liable by law for the damages in this particular matter
 (11) It's important to us that you understand that he's not a
 (12) corporation he's not a group of individuals he's one man a
 (13) human being who has a life who has a family who has
 (14) responsibilities who sleeps at night maybe stays awake at
 (15) night gets up and will be affected for the rest of his life
 (16) by your previous verdict and your verdicts in the next phasing
 (17) of this case It's important for you to know that because I
 (18) think that gets lost in the immensity of this case and the
 (19) fact that Exxon our co-defendant being a corporation but this
 (20) is one man who stands alone and you're going to affect his
 (21) life for the rest of his life
 (22) Now Exxon has said that they will pay the actual damages
 (23) in this phase of the trial the compensatory phase of the
 (24) trial that's good I'm glad to hear that so the only thing
 (25) that you have to decide and maybe I shouldn't say only after

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(1) hearing the two openings is what are the actual damages and I
 (2) submit to you that because of the complexity of the theories
 (3) involved here it's probably going to be a lot of work for you
 (4) to sort through that and figure out what actual damages are
 (5) I on behalf of Captain Hazelwood ask you a couple things
 (6) I'd like you to be fair to both sides the defendants Captain
 (7) Hazelwood being included in the defendants and the
 (8) plaintiffs And I want you to understand that it's your job to
 (9) make a distinction between the actual damages and the what
 (10) for a better word we could call the imaginary or speculative
 (11) or inflated damages The plaintiffs are absolutely entitled to
 (12) every cent of their actual damages and Captain Hazelwood
 (13) wants
 (14) you to award them their actual damages and that's your duty
 (15) and responsibility to do that but it's also your duty and
 (16) responsibility not to award them any more than that and I hope
 (17) that you take that duty and responsibility very seriously and
 (18) see to it that you go through the evidence and that you limit
 (19) your award to what the actual damages are and call out the
 (20) inflated damages wishful thinking damages and give the
 (21) plaintiffs only what they are entitled to that's all we ask
 (22) In conjunction with that because of the complexity of this
 (23) case I ask you to do this and I think you can wait until all
 (24) the evidence is in before you make up your mind The
 (25) plaintiffs are going to call a lot of people to the witness
 stand some experts that are going to give you figures and

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(1) theories as to what happened in Prince William Sound after the
 (2) spill The defendants are also going to have an opportunity to
 (3) call some people who are going to tell you what happened
 (4) Wait
 (5) until you hear all the evidence before you individually in your
 (6) mind form an opinion or make up your mind as to what
 (7) happened
 (8) and what the actual damages are That's only the fair thing to
 (9) do and I think you all can do that
 (10) Another thing I would like you to do is when people testify
 (11) in this case I want you to look at their credibility in terms
 (12) of what is their interest Are they claimants in this case
 (13) plaintiffs friends or relatives of people that have claims in
 (14) this case how do they know what they are saying what is their
 (15) background what is their source of information do they have
 (16) personal knowledge or did somebody tell them something
 (17) These
 (18) are the types of common sense things that every jury has to use
 (19) when they are deciding the facts I'm confident that after you
 (20) hear all the evidence in the case that you're going to be able
 (21) to make that distinction between the actual damages and the
 (22) imaginary damages and I'll tell you something if you can do
 (23) that you will have the potential for the first time and
 (24) probably the last time in this case of not disappointing
 (25) anybody
 I'll be honest with you I was very disappointed with the
 verdict in Phase I Mr Lynch said he was disappointed as
 well but I can tell you this that if you do your job and you

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(1) award the plaintiffs no more or no less than their actual
 (2) damages I won't be disappointed Mr Lynch won't be
 (3) disappointed and the plaintiffs won't be disappointed Thanks
 (4) THE COURT Mr O'Neill you may call your first
 (5) witness
 (6) MR O NEILL We have some preadmitted documents Your
 (7) Honor We also have a podium that we need to get back in
 (8) service
 (9) THE COURT You need that gorilla to move it
 (10) MR O NEILL This is going to be a lengthy list The
 (11) plaintiffs offer the following documents which we believe we
 (12) have an agreement on preadmission Plaintiffs Exhibits 226
 (13) 245 246 253 261 265 270 271 272 274 275 276 277
 (14) 278 279 280 281 282 283 284 285 286 287 288 289
 (15) 292 293 294 295 296 297 298 299 300 301 302 303
 (16) 304 304 A 305 306 307 308 309 310 311 312 313 314
 (17) 339 360 362 363 364 365 366 367 370 372 373 374
 (18) 375 376 377 378 379 380 381 382 383 384 385 386
 (19) 387 388 A 388 B 389 390 391 392 393 394 395 398 471
 (20) 472 473 474 475 477 478 479 480 481 488 492 501
 (21) 508 510 543 637 738 752 769 794 823 3704 6011 6012
 (22) 6018 6020 6021 6023 6024 6025 6026 Defendants Exhibit
 (23) 7124 we offer those exhibits
 (24) (Exhibits 226 245 246 253 261 265 270 271 272 274
 (25) 275 276 277 278 279 280 281 282 283 284 285 286

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(1) 287 288 289 292 293 294 295 296 297 298 299 300
 (2) 301 302 303 304 304 A 305 306 307 308 309 310 311
 (3) 312 313 314 339 360 362 363 364 365 366 367 370
 (4) 372 373 374 375 376 377 378 379 380 381 382 383
 (5) 384 385 386 387 388 A 388 B 389 390 391 392 393 394
 (6) 395 398 471 472 473 474 475 477 478 479 480 481
 (7) 488 492 501 508 510 543 637 738 752 769 794 823
 (8) 3704 6011 6012 6018 6020 6021 6023 6024 6025 6026
 (9) Defendants Exhibit 7124 offered)
 (10) MR LYNCH May I call on Ms Robinson?
 (11) MS ROBINSON That's correct
 (12) MR LYNCH Your Honor for the record I think it
 (13) would be helpful if we could ask the reporter to indicate with
 (14) the exception of DX7142 all of the numbers that Mr O'Neill
 (15) read should be identified as PX numbers
 (16) MR O NEILL They were all PX
 (17) MR NEAL DX7124
 (18) MR LYNCH 42?
 (19) MR O NEILL 7124 I offer those exhibits
 (20) THE COURT I'm still confused about only one of them
 (21) and that's the last one Defendants 7142 or 24?
 (22) MR O NEILL I believe it's 24
 (23) MR LYNCH My paper says 42
 (24) THE COURT Let's get it straight right now
 (25) MR LYNCH 24 it is Your Honor

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- (1) MR O NEILL It is 24
- (2) MR LYNCH That s the only DX
- (3) THE COURT Thank you The list of plaintiffs
- (4) exhibits and the single defendant s exhibit announced by Mr
- (5) O Neill are all admitted without objection
- (6) (Exhibit 226 245 246 253 261 265 270 271 272 274
- (7) 275 276 277 278 279 280 281 282 283 284 285 286
- (8) 287 288 289 292 293 294 295 296 297 298 299 300
- (9) 301 302 303 304 304 A 305 306 307 308 309 310 311
- (10) 312 313 314 339 360 362 363 364 365 366 367 370
- (11) 372 373 374 375 376 377 378 379 380 381 382 383
- (12) 384 385 386 387 388 A 388 B 389 390 391 392 393 394
- (13) 395 398 471 472 473 474 475 477 478 479 480 481
- (14) 488 492 501 508 510 543 637 738 752 769 794 823
- (15) 3704 6011 6012 6018 6020 6021 6023 6024 6025 6026
- (16) Defendants Exhibit 7124 received)
- (17) MR O NEILL Thank you Your Honor
- (18) MS HANSON Good morning Your Honor Plaintiffs
- (19) call their first witness Natalie Fobes And if we could have
- (20) the Court s indulgence we need to set up She s going to show
- (21) some slides
- (22) (The Witness Is Sworn)
- (23) THE CLERK Please be seated For the record state
- (24) your full name address and spell your last name
- (25) THE WITNESS My name is Natalie Fobes F O B E S and

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- (1) I live in Seattle Washington
- (2) THE CLERK Thank you
- (3) DIRECT EXAMINATION OF NATALIE FOBES (Live)
- (4) BY MS HANSON
- (5) Q Good morning Ms Fobes we had the opportunity to meet
- (6) you
- (7) in Phase I but would you remind the jury who you are and what
- (8) you do?
- (9) A Yes I m a free lance photographer and I m based out of
- (10) Seattle Washington and I do work for National Geographic and
- (11) NewsWeek News and a number of small companies too
- (12) Q Can you tell me what this is please?
- (13) A This is a chart showing Prince William Sound
- (14) Q And what do these orange areas indicate?
- (15) A The orange areas are places that I did photographs for the
- (16) story about the oil spill
- (17) Q And is this a fair and accurate representation of where you
- (18) took photographs in Prince William Sound when you were on
- (19) assignment for National Geographic?
- (20) A Yes it is
- (21) MS HANSON Your Honor plaintiffs offer Plaintiffs
- (22) Exhibit 775 A
- (23) (Exhibit 775 A offered)
- (24) MR SANDERS No objection Your Honor
- (25) THE COURT Plaintiffs 775 A is admitted
- (26) (Exhibit 775 A received)

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- (1) BY MS HANSON
- (2) Q Do you know what this is Ms Fobes?
- (3) A This is a chart showing Kodiak Island and the Alaska
- (4) Peninsula
- (5) Q And again the orange areas indicate?
- (6) A The orange areas are the places that I photographed the oil
- (7) spill story
- (8) Q And this is a fair and accurate representation of where you
- (9) took photographs on Kodiak Island and the Alaska Peninsula
- (10) on
- (11) assignment for National Geographic?
- (12) A Yes it is
- (13) MS HANSON Your Honor plaintiffs offer 775 B
- (14) (Exhibit 775 B offered)
- (15) THE COURT Mr Sanders?
- (16) MR SANDERS No objection Your Honor
- (17) THE COURT Plaintiffs 775 B is admitted
- (18) (Exhibit 775 B received)
- (19) MS HANSON Thank you Your Honor
- (20) BY MS HANSON
- (21) Q Just to refresh our memory for a moment could you tell us
- (22) about how long you spent in Alaska on assignment for National
- (23) geographic and where you went and how long you were here?
- (24) A For the oil spill story?
- (25) Q Yes
- (26) A I was here for about three months starting the day after

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- (1) the spill
- (2) MS HANSON Great Without any objection I would
- (3) like to offer Plaintiffs Exhibit 245 consisting of photographs
- (4) taken by Ms Fobes and have her tell the jury what the
- (5) photographs are
- (6) (Exhibit 245 offered)
- (7) THE COURT Is 245 the group of exhibits that I
- (8) previewed?
- (9) MS HANSON Yes
- (10) MR SANDERS Yes sir
- (11) THE COURT Go ahead
- (12) THE WITNESS This photograph was taken near Bligh
- (13) Reef where the tanker was the day after the spill on the 25th
- (14) of 1989 of March 1989 You can see the oil on top of the
- (15) water and then the clear water wakes of the boats going
- (16) through
- (17) it
- (18) BY MS HANSON
- (19) Q This is in that same area and again the clear water wakes
- (20) going through the water on top of the water and a boat in the
- (21) photograph?
- (22) MR SANDERS Can we get a date on these photographs
- (23) as we go through them? Same day?
- (24) THE WITNESS Same day March 25th 1989
- (25) This is also taken March 25th 1989 in that same
- (26) location You can see the oil on top of the water and again

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- (1) the clear water wakes and there is a boom stretched out from
 (2) some sort of service vessel and you can see the oil on both
 (3) sides of the boom
 (4) This next series of photographs were taken on the 29th of
 (5) March This photograph shows some oil in the water booms in
 (6) the water and the oil on the hull of the boat and this was
 (7) taken near Disk and Block islands This is in the same area
 (8) same day boats pulling boom and the oil is on the water
 (9) Also see the oil on the shoreline in the background
 (10) This is in Eleanor Island and it s taken on the same day
 (11) March 29th You can see the oil on the beach and going up to
 (12) the high tide line and oil in the water also This is a
 (13) detailed photograph from that same bay You can see the oiled
 (14) rocks and the fucus the seaweed and some of the barnacles
 on
 (15) the rocks and the oil is in the water
 (16) This is from that same beach or that same bay that same
 (17) day Oil in the water and going up the sides of the rocks and
 (18) it ends right here
 (19) This is on the 29th of March also and it was taken right
 (20) around the point Eleanor in a bay on Eleanor Island and this
 (21) bay is just full of thick oil on top of the water You don t
 (22) see any clean water in this photograph at all
 (23) This again is from that same area You can see the oil on
 (24) both sides of the boom and as far as you know in that
 (25) photograph it s all oil

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- (1) The same bay showing again a little more of the oil from
 (2) here all the way across
 (3) BY MS HANSON
 (4) Q Is that the same date Ms Fobes?
 (5) A Yes it s the same day All of these photographs were
 (6) taken on the 29th of March
 (7) MR SANDERS If you could just tell us when you get
 (8) to the end of the 29th of March save a lot of time
 (9) THE WITNESS Okay Here you can see a little more of
 (10) the beach and oil on the beach
 (11) This is a detail of the oil on top of the water in that
 (12) same bay and also you can see the oil on the rocks on the
 beach
 (13) in the background
 (14) This is looking out from that same bay You can see the
 (15) oil in the water and you can see the oil on the boom The oil
 (16) is on both sides of the boom
 (17) This was taken on the 30th of March and it s between Disk
 (18) and Block Island You can see the oil in the water here and a
 (19) boom with oil on it and these are called pom poms
 (20) This is an aerial photograph taken the 1st of April looking
 (21) toward Montague Island kind of toward where Sawmill Bay is
 (22) You can see the oil on the water
 (23) These photographs were taken from the next - the next
 (24) series were taken from airplanes on the 2nd of April in 1989
 (25) and they were all of Knight Island and then islands around

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- (1) there I mean Knight Island bays
 (2) This shows oil in the water This is looking directly down
 (3) at a service vessel with oil inside of a boom and you could
 (4) also see the different kinds of thickness of oil around it and
 (5) see how it s going toward the beach also
 (6) You can see the boom held between two boats and the oil is
 (7) on top of the surface of the water and you could see how the
 (8) boom has left clear water wakes behind it
 (9) This is oil on the water and to give you some idea about
 (10) how big this oil is or this particular photograph shows the
 (11) territory it covers right up here you can see two fishing
 (12) boats with a boom stretched between them
 (13) This is one of the bays on Knight Island and the oil in the
 (14) water
 (15) You ll see the oil is up on the shores
 (16) This is in Herring Bay It shows the water covered with
 (17) oil
 (18) MR SANDERS Are we on the same date?
 (19) THE WITNESS I have it on the same date yeah And
 (20) again this is all oil
 (21) Again Herring Bay same date This is all the oil in the
 (22) water in Herring Bay
 (23) Now these photographs the next two or three I believe
 (24) were taken on the 4th of April and this shows boats with boom
 (25) between them and oil on the water This is Northwest Bay I m

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- (1) sorry this is a detail photograph showing oil on a beach on
 (2) Smith Island
 (3) MR SANDERS Same date?
 (4) THE WITNESS I m looking for that sir I have that
 (5) on the 8th of April
 (6) This is also on the 8th of April and it shows the oil
 (7) this is a detailed shot of oil on the water and the fucus or
 (8) that seaweed is there
 (9) This photograph was taken on the 16th of April and this
 (10) shows oil on the water in Prince William Sound
 (11) This photograph was also taken on the 16th and you can see
 (12) the oil coming off of the beach of this island in Prince
 (13) William Sound
 (14) Now I do want to mention that this little reflection here
 (15) is my float coat in the window But you can see from this
 (16) photograph that it s - that is the oil coming off the beach
 (17) This was a detail of a beach on Eleanor Island you can see
 (18) the oil on the fucus on the beach
 (19) BY MS HANSON
 (20) Q Do you have a date?
 (21) A Yes that s the 16th of April
 (22) Now this next series of photographs were all taken on the
 (23) 5th of April and this shows oiled fucus or the seaweed and the
 (24) barnacles on an oiled rock and that s on Seal Island
 (25) This is looking straight down at the beach from just my

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- (1) height and you can see the oiled grass seaweed of some sort
- (2) and the fucus and mussels and barnacles
- (3) This is a close up of the barnacles on a rock and the oil
- (4) This is a detail of the water and the oil and the water
- (5) and the oil on the seaweed or sea stuff
- (6) Now the last few photographs were all taken in this
- (7) general area so I backed up to show kind of the general scene
- (8) and this is it you can see the barnacles and some of it is
- (9) behind me also but this is a general beach as far as that
- (10) This is on Hallo Bay in the Katmai National Park on the
- (11) Alaska Peninsula and this photograph was taken on the 10th of
- (12) May 1989 You can see the oil on the beach there here this
- (13) reflection is oil
- (14) This is taken the same location same day a detail showing
- (15) the oil on the beach and fucus or seaweed Same beach same
- (16) day
- (17) This again is Hallo Bay on the Alaska Peninsula and you
- (18) can see the oil on the beach leading back up
- (19) This was also taken on that same beach and this was taken
- (20) on the 18th of May This shows a fisherman scooping oil
- (21) soaked
- (22) sand from underneath the water so all of this is oil sand
- (23) And I'm photographing under water
- (24) This is taken at Wide Bay on the Alaska Peninsula and it
- (25) was on the 11th of May and it's an oiled bird carcass that the
- (26) worker is picking up

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- (1) This shows some of the oil splattered on the grass on the
- (2) Alaska Peninsula Dry Bay and that photograph was taken on
- (3) the
- (4) 11th of May
- (5) This shows the oiled grass at Dry Bay also on the 11th
- (6) A detail of the oil on the beach
- (7) This photograph was taken on the 13th of May It's a bay
- (8) over on the Alaska Peninsula and you can see the oil in the
- (9) bay
- (10) Again also on that same day oil in the water in the bay
- (11) This is the native village of Larsen Bay on Kodiak Island
- (12) This is a crab that I photographed on one of the beaches
- (13) right in front of the village You can see that the crab has
- (14) oil on its back and little legs then oil on the rocks also
- (15) MR SANDERS Date on that please?
- (16) THE WITNESS 14th of May
- (17) MR SANDERS Is that true for the previous one also?
- (18) THE WITNESS The previous one was the 5th of May
- (19) I'm sorry forgot
- (20) MR SANDERS That's all right
- (21) THE WITNESS These are aerials of Northwest Bay and
- (22) some of the boats and the oil on the water and booming
- (23) activity
- (24) And these were taken on the 22nd the last one and this
- (25) one were taken on the 22nd of May This is Northwest Bay
- (26) again

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- (1) This is Green Island You can see the booms and the oil on
- (2) the beach This was taken on the 22nd also
- (3) This was in Herring Bay And you can see the oil on the
- (4) water and on the fucus and on the boom This was taken on the
- (5) 30th of May
- (6) Now the next series of photographs were taken on the 28th
- (7) of May and they show Herring Bay and this is an oiled beach
- (8) in Herring Bay You can see the oiled fucus or seaweed and the
- (9) oiled rocks
- (10) You can see the oiled fucus seaweed and the mussels
- (11) This shows a tide pool on one of the beaches in Herring Bay
- (12) the oiled fucus
- (13) This is a stream in Herring Bay This is the mouth of the
- (14) stream as it enters into the bay And you can see the oil on
- (15) the surface of the stream water
- (16) This photograph was taken on the 27th of May and this is
- (17) Disk Island There is a lagoon in the middle of Disk Island
- (18) You can see the oil in the water
- (19) The next series of photographs were taken on the 25th of
- (20) May This is on Block Island You can see the oily waves and
- (21) the oily fucus or seaweed that are in the water
- (22) This is oil this is a detail of that same beach this is
- (23) oil and then you can see the oil on the beach This is the
- (24) water
- (25) Another detail of the same beach with more of the fucus and

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- (1) the oil
- (2) This photograph I believe was taken on the same day I
- (3) can look through my notes to determine that It shows a chiton
- (4) with oil and this is kind of a shellfish that sticks to the
- (5) side of rocks and the oil stringing down And that was taken
- (6) on the 25th of May and that was Block Island sorry
- (7) This is a little starfish that I photographed on Naked
- (8) Island on the 27th of May You can see the oil on it
- (9) This is an aerial photograph of some herring spawn and the
- (10) white stuff underneath the water is the spawn of herring This
- (11) was taken on the 13th of March
- (12) Now you can see that same herring spawn here in a bay that
- (13) has oil on the beaches and there is oil floating in the water
- (14) That was taken the same day
- (15) This shows the float pens the net pens at the AFK hatchery
- (16) in Sawmill Bay Some boom around it
- (17) The next few photographs were taken on the 11th of May
- (18) That was over on the Alaska Peninsula Dry Bay This shows a
- (19) bear paw print in oil on the beach
- (20) This is another paw print from a bear on the beach This
- (21) was a blob of oil and he walked right in it
- (22) This is a photograph of a bear in Wide Bay and you can see
- (23) the oil on his back and on his haunches
- (24) MR SANDERS What day?
- (25) THE WITNESS The 11th also

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- (1) This is a different angle of this very same bear You can
 (2) see the oil on his head and his paws and his back and his
 (3) haunches also
 (4) These photographs were taken on the 16th of May and they
 (5) are all from Hallo Bay You can see a bear on the beach and
 (6) oiled logs on the beach at Hallo Bay
 (7) And he s scavenging for food at that point
 (8) And he grabbed something and ate it something from the
 (9) beach You can see the oil splashed on the logs here
 (10) These are harbor seals this photograph was taken at Katmai
 (11) National Park on the Alaska Peninsula and you can see they
 (12) have oil rubbed on them in some area This is the color they
 (13) are supposed to be a creamy white with some dots on them
 The
 (14) 16th of May also
 (15) Now the next series of photographs were taken on the 29th
 (16) of May and these are all in Herring Bay and these show harbor
 (17) seals hauled out on the rocks on the oiled rocks and they
 (18) are as you can see dark Now see the circles around the one
 (19) guy s eyes that s more the color they are supposed to be and
 (20) this one is more the color they are supposed to be although he
 (21) has oil on them These guys are totally blackened with the
 (22) oil
 (23) This is a seal mom and pup on a haul out in Herring Bay and
 (24) they are totally oiled
 (25) MS HANSON Thank you Ms Fobes

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- (1) Nothing further Your Honor
 (2) THE COURT Mr Sanders anything?
 (3) MR SANDERS Just a couple questions I won t need
 (4) the screen we can take that down and that might save some
 time
 (5) CROSS EXAMINATION OF NATALIE FOBES
 (6) BY MR SANDERS
 (7) Q If I may I may proceed while that s going on I don t have
 (8) anything earth shattering to say
 (9) Ms Fobes you were assigned to come up and take these
 (10) photographs?
 (11) A Yes I was
 (12) Q And those photographs later became part of a story or a
 (13) presentation or feature in National Geographic correct?
 (14) A Yes
 (15) Q And the name of the story or the feature was?
 (16) A Well you know I don t know - Can the Wilderness
 (17) Survive Do you have it here I m sorry
 (18) Q Didn t you get a prize for these photographs?
 (19) A I did
 (20) Q Somewhere in this stack I ve got I think the name of it
 (21) with the prize - where did you get the prize from?
 (22) A I got the award from the World Press Association and it
 (23) was a second place award for photo story
 (24) Q Let me see if I can refresh your recollection Alaska s
 (25) Big Spill does that sound right?

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- (1) A That may be what I called it I d really like to look at
 (2) the National Geographic to see what the name of it is in that
 (3) one
 (4) Q I can only show you the listing of the award winners?
 (5) A Okay That s what is listed on here
 (6) Q That may or may not be what it was called in National
 (7) Geographic?
 (8) A I m sorry sir I don t know
 (9) Q That s all right
 (10) A And there were two stories that ran also so
 (11) Q And you got the award for this one?
 (12) A I got the award for a combination of the photographs from
 (13) the first and the second
 (14) Q And it was a presentation or at least your photographs
 (15) were a presentation of oil as a result of the spill?
 (16) A It was a presentation of the photographs I took during the
 (17) oil spill yes
 (18) Q Now I tried to keep up with the dates and the places in my
 (19) own perhaps inept way but if I took this down correctly and
 (20) understood you correctly you took some photographs of
 Prince
 (21) William Sound in kind of a broad aerial shot on the 16th of
 (22) April and that was in the early section And then from then
 (23) on with perhaps one exception all of your pictures were on
 (24) beaches or in bays or lagoons is that a correct statement
 (25) when you get into the later April and May period?

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- (1) A If I can have a moment I ll look back through the log
 (2) Q And that one exception would be some photographs on
 Block
 (3) Island I believe The rest of them I believe were in places
 (4) like Hallo Bay Herring Bay Sawmill Bay Herring Bay a lagoon
 (5) on Disk Island is that right?
 (6) A And the question again? I m sorry
 (7) Q Is that correct is that after the one long shot I believe
 (8) on April 16th of Prince William Sound the oil on the water
 (9) the other shots of oil and water are in bays with the possible
 (10) exception of the Block Island picture and I wasn t clear on
 (11) where that was from?
 (12) A The photographs that I showed here?
 (13) Q Yes that s what I m talking about
 (14) A Right
 (15) MR SANDERS I have no further questions Your Honor
 (16) MS HANSON Nothing further
 (17) THE COURT Thank you You may step down
 (18) THE COURT She doesn t play cards
 (19) MR O NEILL How many lawyers does it take to fold up
 (20) a card table?
 (21) MR JAMIN Your Honor plaintiffs call Charles
 (22) Peterson as an expert witness in the science of ecology
 (23) THE CLERK Raise your right hand
 (24) (The Witness Is Sworn)
 (25) THE CLERK For the record sir state your name your

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- (1) address and spell your last name
 (2) THE WITNESS My name is Charles Henry Peterson the
 (3) last name is spelled P E T E R S O N And my address is 232
 (4) Oak Leaf Drive Pinedale Shores North Carolina
 (5) DIRECT EXAMINATION OF CHARLES PETERSON (Live)
 (6) BY MR JAMIN
 (7) Q How are you currently employed?
 (8) A I am employed now as a professor at the University of North
 (9) Carolina at Chapel Hill where I have duties that involve
 (10) teaching and research and I am employed secondarily as a
 (11) fisheries manager by the state of North Carolina and as an
 (12) environmental manager and third I work as a scientific
 (13) advisor and peer reviewer for the Exxon Valdez oil spill
 (14) trustees
 (15) Q Can you give us an estimate of what percentage of time you
 (16) spend on the three roles you ve described?
 (17) A Yes I would say about 70 percent of the time I devote to
 (18) the first part of being professor in other words about nine
 (19) months or so of the year and something like ten to 15 percent
 (20) in my role as fisheries manager and environmental manager
 (21) and
 (22) another ten to 15 percent in my role as an advisor to the Exxon
 (23) Valdez oil spill trustees
 (24) Q Thank you sir Can you tell us a bit about your post high
 (25) school education?
 A Yes When I left high school I went to college and got my

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- (1) bachelor s degree from Princeton University in New Jersey that
 (2) was in 1968 I received a masters in 1970 and then a Ph D in
 (3) 1972 from the University of California at its Santa Barbara
 (4) campus
 (5) Q At Princeton what did you study sir?
 (6) A I got my degree in biological sciences
 (7) Q As you went on to the University of California at Santa
 (8) Barbara what was your area of concentration?
 (9) A At UC Santa Barbara I received my master s degree in
 (10) zoology and my Ph D in biological sciences
 (11) Q Did you receive academic awards sir as an undergraduate?
 (12) A Yes I did
 (13) Q What were they?
 (14) A I received awards from the National Science Foundation that
 (15) allowed me to pursue research under the mentorship of some
 (16) professors I also received awards at the end of my career I
 (17) was named to Phi Beta Kappa which is an honor which
 (18) acknowledges your academic performance as an
 (19) undergraduate and
 (20) I also received fellowships for graduate and postgraduate
 (21) studies from the National Science Foundation from the
 (22) Woodrow
 (23) Wilson Foundation and the Ford Foundation
 (24) Q Before we go forward sir and talk about your post
 (25) education experience let me ask you how did you first get
 involved or interested in biology?
 A Well I guess like a lot of people I spent summers on the

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- (1) beach and I became interested in the sorts of things that
 (2) washed up on the shore and simply had all these questions
 (3) about where they came from and why they were there and it
 (4) just
 (5) started making me interested in nature and fortunately I ve
 (6) been able to follow that interest with a career
 (7) Q Since graduating from the University of California at Santa
 (8) Barbara how have you been employed?
 (9) A When I left graduate school my first job was at the
 (10) University of Maryland Baltimore County where I was an
 (11) assistant professor the first step in sort of the academic
 (12) rungs I was an assistant professor there for four years
 (13) leaving in 1976 and that s when I went to the University of
 (14) North Carolina where I took a job there as an associate
 (15) professor and then was subsequently promoted to full
 (16) professor
 (17) in 1983 and that s the rank that I remain at there is none
 (18) higher in our system
 (19) Q Do you have your full professorship in any particular
 (20) discipline or area?
 (21) A Yes actually multiple ones My full professorship is a
 (22) professorship of marine sciences which doesn t relate to the
 (23) military but means oceanography and in biology and in
 (24) ecology
 (25) so I m actually a full professor in three different programs at
 the university
 Q And is there a series of courses sir that you teach to
 graduates and undergraduates at Chapel Hill?

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- (1) A Yes I do teach
 (2) Q What are they?
 (3) A I regularly teach courses in marine ecology in biological
 (4) oceanography and in coastal barriers ecology And I teach
 (5) other courses irregularly notably graduate seminars in areas
 (6) where there is interest in a particular discipline that I have
 (7) expertise in
 (8) Q All right Now you ve mentioned the word ecology a couple
 (9) times can you give us a general description of its content?
 (10) A Yes ecology is the study science of understanding what
 (11) controls the distributions and abundances of plants and
 (12) animals
 (13) in nature and it involves of course understanding the
 (14) impacts of the chemical physical and biological environment
 (15) on living organisms
 (16) Q When you say living organisms over what range are you
 (17) talking about in the field of ecology?
 (18) A Well ecology covers all organisms from the microbes that
 (19) you need a microscope to see to the largest to the whales and
 (20) humans at the top so it s the full range of organisms through
 (21) the entire food chain
 (22) Q Where do you yourself work in that range as an ecologist?
 (23) A I work at basically all levels in that range That is to
 (24) say the work that I do is designed to understand the broader
 (25) ecosystem I focus most of my attention at things that exist
 at the plants the invertebrates the fish and higher levels

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- (1) but I work throughout the range of organisms
- (2) Q Have you written articles sir for peer review journals in your field?
- (3) your field?
- (4) A Yes I have
- (5) Q Do you have some idea how many there have been?
- (6) A Yes it's in the ballpark of 85 articles that I've written
- (7) and had published
- (8) Q What fields have you written in?
- (9) A Well I've written in marine ecology I've written in biological oceanography I've written in fisheries ecology in paleontology I'm trying to think environmental management and a few others Well all notably biostatistics I've written
- (10) papers in as well
- (11) Q Have you yourself also peer reviewed other scientists work?
- (12) A Yes I do that with unfortunate frequency
- (13) Q How many different journals or publications have you worked
- (14) for in that role sir?
- (15) A I would say certainly more than 40 and probably more than 50 journals and publishers I've worked for as a peer reviewer
- (16) Q Can you give us some idea roughly about how many articles you've peer reviewed?
- (17) A Well I think it exceeds a thousand I may have approached 3 000 I would say 2 000 is probably a reasonable estimate
- (18) Q Apart from being a peer reviewer have you been an editor of journals in your field?

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- (1) A Yes
- (2) Q Which are?
- (3) A Well I've previously edited but no longer I've previously edited a journal named Estuaries another that is a pair of journals handled by the same editorial journal called Ecology Ecological Monographs and Paleocology (ph) I still serve as an editor for Marine Progress Series and I'm editor in chief for a journal named Oecologia which is a journal for the International Ecological Society
- (4) Q Now in addition to your work as a teacher and your work with peer reviewing and editing in your field did you also work sir for government agencies?
- (5) A Yes I do
- (6) Q What sorts of work do you do for government agencies?
- (7) A Well I do have right sort of diverse variety of work and I guess I could begin to categorize it I work on problem solving panels where the agency identifies the problem I have worked to review the functioning of agencies and how well they are pursuing their mandates I have worked to review grants and projects submitted to agencies and as well I have worked on scientific steering committees where agencies create a committee of a group of scientists to develop a research area that they think needs exploring
- (8) Q Let's take those briefly one at a time With respect to the problem solving panel role what's involved in that

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- (1) function?
- (2) A What one does in these problem solving panels is as follows The agency identifies a problem often a dispute often an issue over which there is some debate and for which resolution is needed for the agency to pursue its proper mandate and then the agency identifies a group of experts appropriate to come together and then review all the available evidence to argue it out see where we come down on the issue and to write a report that gives the best possible overview of the problem at hand sometimes as well we identify areas that need further research so that the problem could be solved but in the case when enough evidence is available we would write the report in a way that identifies what we might conclude
- (3) Q Have you worked on any such panels here in Alaska sir?
- (4) A Yes I have
- (5) Q And can you give us an example?
- (6) A Yes In fact I continue work on a panel that has been established by the National Research Council of the National Academy of Sciences called the Bering Sea Ecosystem Panel and our task on this panel is to try to understand and present for the state department who is ultimately the agency interested in this work and who commissioned it in a way our task is to understand what has happened to the ecosystem to make for long term declines in some of the sea birds and marine mammals
- (7) in the Bering Sea

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- (1) Q You also mentioned a function in your governmental activity wherein you review research grants could you describe that briefly as well?
- (2) A Yes This is part of what we in academia call the peer review process What we do is as follows I would receive a proposal sent to me by one of these agencies and request that I sit down read it cover to cover word for word and evaluate the quality of the science that's being proposed in that proposal and then I would write a review this would be an anonymous peer review my name whether I wanted it to or not the agencies would not associate my name and that is the hope that my comments would be more open than they might otherwise be and I wouldn't be inhibited I would write these comments down as a formal review I would identify the strengths and the weaknesses of the proposal as I viewed them and then send that review back to the agency to help them make decisions about how to allocate their research funds and which proposals to fund and which proposals not to fund
- (3) Q Very well Can you give us a sampling of some of the agencies in the United States and internationally that you have done this review research grant process with?
- (4) A Yes I reviewed for the National Science Foundation NSF for the Environmental Protection Agency EPA for ONR which stands for the Office of Naval Research For NOAA the National Oceanographic and Atmospheric Admission and in fact

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- (1) within NOAA there are multiple components that I have worked
 (2) and reviewed for notably the National Marine Fisheries
 (3) Service the Sea Grant College Program the National
 Underwater
 (4) Research Program and the NOAA Global Change Program I
 have
 (5) reviewed for all four of those
 (6) Internationally I have reviewed for the Australian
 (7) government in a program that s called the Australian Research
 (8) Council I reviewed in Canada for their NSERC program which
 (9) stands for Natural Sciences and Environmental Research
 Council
 (10) and that s the equivalent of our National Science Foundation
 (11) And I ve similarly reviewed for the British program that is the
 (12) same thing it s the government program to fund basic science
 (13) I do additionally reviewing work for the Canadian government
 (14) for a research program that is called OPEN O P E N and that
 (15) stands for Ocean Production Enhancement Network and is a
 large
 (16) program that combines industry and academia to develop ways
 to
 (17) enhance the production of codfish and sea scallops on the
 (18) eastern coast of Canada
 (19) Q For the National Marine Fisheries Service one of the
 (20) governmental groups that you ve mentioned what sorts of work
 (21) have you done in this grant proposal area?
 (22) A Well I ve reviewed grant proposals on fisheries ecology
 (23) on fisheries management on habitat development for fisheries
 (24) on restoration for fisheries and a variety of other areas
 (25) Q And can you estimate for us how many different research

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- (1) grant projects for these various agencies both nationally and
 (2) internationally you ve reviewed in your career?
 (3) A That s another depressing number which I - my estimate
 (4) again is in the same ballpark probably 2 000 maybe as many
 as
 (5) 3 000 reviews of proposals over these years
 (6) Q Switching to the third governmental role that you
 (7) articulated you mentioned agency program where you would
 (8) review the effectiveness of the agency can you briefly
 (9) describe that?
 (10) A Yes although I might best describe it with an example
 (11) The issue here is that governments believe it or not
 (12) occasionally ask the question of whether they are doing a good
 (13) job in pursuing their mandate whatever they may be and then
 (14) bring in usually people from outside to review their programs
 (15) and to address how well they are functioning and I have done
 (16) those sorts of reviews for a variety of programs The one in
 (17) Australia that I mentioned a moment ago the Australian
 (18) Research Council is one I reviewed and I went there and
 (19) reviewed how well they were doing for funding of ecology I ve
 (20) done that same thing for our national government program in
 (21) oceanography and done a review and this is a group of people
 (22) who come together and look at the mandate of the program
 look
 (23) at the process whereby they make decisions and look at the
 (24) answerability how effective that money has been spent and
 (25) I ve done a review of that sort for example for the EPA for

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- (1) their environmental research programs in Oregon that are
 (2) devoted to understanding the toxicology of sediments in the
 (3) marine environment and I twice participated in a review of
 (4) that program
 (5) Q Very well With respect to the fourth role where you serve
 (6) on scientific steering committees what are you doing in that
 (7) area sir?
 (8) A Well in that area we are trying - the group usually a
 (9) government agency sometimes multiple agencies sometimes
 state
 (10) agencies have a particular mandate that they have to pursue
 (11) such as fisheries for the National Marine Fisheries Service and
 (12) management with understanding of fisheries They may decide
 at
 (13) some point in time that they need to develop a new thrust a
 (14) new research program to fill some sort of void in our
 (15) understanding and when they do they will often identify
 (16) experts to sit on these advisory panels or steering committees
 (17) they are often called to try to develop the structure the
 (18) scope and just what that program ought to look like and
 (19) that s the function that these affinities play
 (20) Q Can you give us an example of an agency in that area?
 (21) A Yes a program one of those that I ve worked on and in
 (22) fact I was the first chairman of is a program with the acronym
 (23) like they all seem to have of GLOBEC and that stands not for
 (24) a stock exchange but for Global Ocean Ecosystems Dynamics
 and
 (25) the words seem hard but it s straightforward the program was

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- (1) designed and still on at a rate of 20 million dollars a year
 (2) studies what the impacts of global climate change would be on
 (3) the production of marine fisheries as created by affecting the
 (4) ecosystem in which these fisheries are found and this is a
 (5) program that began in the U S with our steering committee I
 (6) served as chairman of that group for the first three years and
 (7) now it s become an international problem so there are GLOBEC
 (8) steering committees in multiple countries and now it s being
 (9) run by some of the international corporations What should be
 (10) international a global change program
 (11) Q Have you been appointed to fishery management boards at
 (12) all?
 (13) A Yes twice as a matter of fact I m in my second term
 (14) serving as a commissioner managing marine fisheries in North
 (15) Carolina on our marine fisheries commission
 (16) Q Have you served or been appointed at all to represent the
 (17) United States Government in an international fisheries
 (18) organization?
 (19) A Yes I served a period of - I believe it was about seven
 (20) years as an expert to the shell fisheries committee of ICES
 (21) another international organization standing for the
 (22) International Council for Exploration of the Sea and this is
 (23) an international body composed of all the bodies above the
 (24) north Atlantic rim so they can meet periodically resolve
 (25) problems in fisheries biology and resolve disputes over

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(1) management of fisheries and has continuing importance but
 (2) some years ago was interesting because it was the only body
 (3) outside the U N that the then Soviet Union and the U S had
 (4) joint membership in so there were some interesting political
 (5) interactions in the old days
 (6) Q Very well Let s take a moment to look at your own
 (7) research I assume that you do some research as well?
 (8) A You bet
 (9) Q Can you give us an idea of your particular areas of
 (10) interest?
 (11) A Yes I suspect the best way to answer that is to just give
 (12) you the idea of some of the projects I m working on now and
 (13) that s rather reflective of what I do
 (14) I have one project that s designed to look at how oyster
 (15) reef habitats and sea grass habitats serve the production of
 (16) marine fishes both shellfishes and finfishes and how to
 (17) restore those habitats how we can use as academic ecologists
 (18) have learned about the ecosystem this habitat to produce
 (19) something productive mainly fish That s my biggest project
 (20) at the moment I m working on a project over some years that
 (21) compares the lagoons in the Pacific Indian Atlantic and the
 (22) Southern ocean and looks at the bi valves bi valves are clams
 (23) and in fact I look at the clams we eat in those systems quite
 (24) explicitly I have a program that s just begun in which I use
 (25) the Navy submarine Alvin to go down to the deep seafloor in

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(1) deep sea vents and examine the community composition of
 those
 (2) things and how they function
 (3) I have a program to look at floating sargassum in the
 (4) sargasso sea and in the gulf stream which is a plant around
 (5) which is built a whole variety of animals which like the
 (6) sargassum and predators of those animals And the program
 (7) there is to understand the ecosystem around the sargassum
 and
 (8) I ve got another active program at the moment which is trying
 (9) to understand how bottom feeding fishes change the behavior
 of
 (10) the prey organisms that they prey upon to get a better feel for
 (11) the interactions that go back and forth between the predator
 (12) and prey
 (13) MR JAMIN I ve got two or three more minutes with
 (14) qualifications
 (15) MR O NEILL Just offer him
 (16) BY MR JAMIN
 (17) Q Let me take a moment because of my co counsel s
 assistance
 (18) here Tell us a bit how you got involved with the Exxon Valdez
 (19) oil spill and the trustees?
 (20) A I was sitting at home in the office minding my own business
 (21) in between going out in the field and having to teach a lecture
 (22) the next day that I wasn t quite prepared for when I had a
 (23) phone call asking if I would serve as an expert to help the
 (24) trustees to evaluate the damages caused by the Exxon Valdez
 oil
 (25) spill and then contribute to looking into restoring the system

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(1) at some later date After some subsequent discussion I agreed
 (2) Q Have you been involved with that sir for the last five
 (3) years then?
 (4) A Yes I have from a period of summer 1989 began my
 (5) involvement
 (6) Q Does your involvement continue today?
 (7) A Yes I continued actively to work for the trustee council
 (8) Q With reference to the full range of your activity whether
 (9) it s your research peer reviewing your work for governments
 (10) work for the United States your work for other countries can
 (11) you give us some idea what percentage of your work has
 involved
 (12) fisheries and fish production issues?
 (13) A Well I can certainly say that it exceeds 50 percent I
 (14) mean very clearly over half my time is devoted to fish
 (15) explicitly and to the ecosystem and how it produces fish
 (16) MR JAMIN Your Honor as Mr O Neill says in the
 (17) interest of the shortness of life plaintiffs would request
 (18) that the court recognize Dr Peterson in ecology with
 (19) particular emphasis in marine ecosystems and the role of fish
 (20) in the ecosystem
 (21) MR SANDERS I m sorry Your Honor but I have some
 (22) voir dire that I would like to request Seems to me the scope
 (23) of the offer is beyond the scope of the previous questioning
 (24) THE COURT Let s take our break We ll recess for 15
 (25) minutes

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(1) (Jury out at 12 05 p m)
 (2) (Recess at 12 05)
 (3) (Jury in at 12 18 p m)
 (4) THE CLERK All rise
 (5) THE COURT Mr Sanders
 (6) MR SANDERS May I proceed Your Honor?
 (7) THE COURT You may
 (8) VOIR DIRE OF CHARLES PETERSON
 (9) BY MR SANDERS
 (10) Q Dr Peterson my name is Jim Sanders I don t think we ve
 (11) ever met Good afternoon to you
 (12) A Hi
 (13) Q Let me ask you a couple questions about your expertise and
 (14) what it covers and specifically I ll just tell you up front
 (15) I m going to ask you what it doesn t cover As I understand it
 (16) you don t have any expertise or don t purport to be an expert
 (17) as a salmon biologist correct?
 (18) A I think it is appropriate for me to answer that by saying
 (19) that I would not define myself as a salmon biologist or a
 (20) fisheries population dynamicist but I do consider myself an
 (21) ecologist of fish and their role in the ecosystem
 (22) Q Well have you ever done any scientific research regarding
 (23) salmon?
 (24) A What I have done regarding salmon is to work extensively
 (25) now for five years for the Exxon Valdez oil spill trustee

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- (1) council in evaluating how the ecosystem of Prince William Sound
- (2) and northern Gulf of Alaska works and explicitly how salmon
- (3) fit into that I have worked similarly with a group which now
- (4) has a large project in the field on salmon and herring ecology
- (5) and biology as they relate to the ecosystem in Prince William
- (6) Sound where I was the principal peer reviewer in setting up
- (7) that program and putting it to work as well salmon are a key
- (8) and very important part of the Bering Sea ecosystem that I am
- (9) working on as we speak although not this moment trying to
- (10) address how various components of that affect salmon and other
- (11) parts of the ecosystem That work is quite extensive
- (12) Q Let me try it again Have you personally conducted any
- (13) scientific research regarding salmon yes or no?
- (14) A If by scientific research you mean a published paper the
- (15) answer is no but that is not the full scope of scientific
- (16) research
- (17) Q In the course of your work with the trustees there were
- (18) various salmon studies that were done by the trustees correct?
- (19) A That s correct
- (20) Q And isn t it a fact that you formally didn t peer review
- (21) any of those?
- (22) A I served as a larger group that responded to the peer
- (23) reviews of others and integrated the work on salmon with the
- (24) other components of the ecosystem Furthermore at the
- (25) moment I have been a peer reviewer so your comment is not true for the

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- (1) program which is the SEA the sound ecosystem program now
- (2) designed to understand salmon and herring in the ecosystem
- (3) So
- (4) the answer to your question is no it was false
- (5) Q So now you have been a peer reviewer recently on this
- (6) whatever program you just described?
- (7) A Yes I ve been a peer reviewer and I was the keynote
- (8) speaker to start off the scientific meeting of agency
- (9) scientists and other peer reviewers in Cordova that began the
- (10) evolution of the SEA program as it now exists
- (11) Q Let me ask you the same question with respect to herring
- (12) Have you ever conducted any scientific research regarding
- (13) herring?
- (14) A Again the answer is a similar one I have not published a
- (15) paper that has dealt with herring explicitly but I have
- (16) pursued the role of herring the ecology of herring in the
- (17) context of the ecosystem for the trustees and now for the
- (18) National Academy of Sciences And I should add for the
- (19) National Academy of Sciences our ultimate product will be a
- (20) book that we publish and in that book I can tell you already
- (21) because we ve begun to write herring and salmon will play a
- (22) large role
- (23) Q Did the trustee group or the trustees publish any studies
- (24) on herring?
- (25) A There have been numerous reports written but the trustees
- (26) per se are not a group that does publish but rather a group

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- (1) that manages the whole process of evaluating the impacts of
- (2) the
- (3) oil spill on the ecosystem and in that regard has a mandate
- (4) for reviewing the projects that they fund for deciding what to
- (5) fund and for public dissemination of the results
- (6) Now the scientists who have been involved have indeed
- (7) written reports on both herring and salmon and some of those
- (8) have been published
- (9) Q And is it not a fact that you were not a formal peer
- (10) reviewer on any of those such studies on herring?
- (11) A That is true
- (12) Q Now are you an expert on fisheries population dynamicist?
- (13) A No I would not call myself a fishery population dynamicist
- (14) in the sense that that term is commonly used which means a
- (15) mathematical modeler of population trends but instead I am
- (16) indeed a fisheries ecologist and understand and work on the
- (17) role that the fish play in the ecosystem
- (18) Q In the long list of articles that you referred to and
- (19) counsel referred to during the first part of your direction
- (20) examination have you written any articles on salmon or
- (21) herring?
- (22) A None of those articles explicitly deal with salmon or
- (23) herring
- (24) Q Your primary focus is as a benthic geologist is that
- (25) correct?
- (26) A I guess I get to correct you I m not a geologist

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- (1) Q I meant ecologist I m sorry
- (2) A My most focused work that is to say the area that I
- (3) specialize in more than any is the benthos the animals and
- (4) plants of the seafloor but it is by no means the exclusive
- (5) area in which I do research or have expertise
- (6) For example the GLOBEC program that I talked about a
- (7) moment ago to look at global production of fish in the
- (8) ecosystem is fundamentally a waterfowl program and doesn t
- (9) deal with the seafloor except in a very narrow way
- (10) Q In fact as a participant in the - as a peer reviewer for
- (11) the trustees in dealing with the salmon questions
- (12) particularly as to the interaction between the number of
- (13) spawners the number of recruits and how that affects the
- (14) salmon population you ve had to rely or you have relied upon
- (15) other peer reviewers who are more expert in those areas isn t
- (16) that a fact?
- (17) A I certainly take vantage of expertise when I trust the
- (18) experts and I have worked together with the peer reviewers for
- (19) fish for birds for mammals for the air and water resources
- (20) as well as other peer reviewers for the benthic ecology
- (21) resources that you referred to
- (22) I would say I rely on what I consider to be expert opinion
- (23) when I find it and have done so for herring and salmon as
- (24) well
- (25) Q Let me ask you may I approach the witness Your Honor?

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- (1) THE COURT You may
 (2) BY MR SANDERS
 (3) Q Look at the questions and answers on starting at page 314
 (4) going over to 315
 (5) A Thank you
 (6) Q And I will concede to you that the statements are in the
 (7) context of another question involving disagreements or
 (8) differences that you might have with Dr Spies and just so the
 (9) jury understands who is Dr Spies?
 (10) A Dr Spies is the chief scientist so called that s his
 (11) position for the trustee council He previously was an
 (12) academic at the Lawrence Livermore Laboratory at the
 (13) University
 (14) of California
 (15) Q Let me ask you if you gave this answer and I ll read the
 (16) whole part of it down to about line 25 so that the context is
 (17) in there but let me ask you if you gave this answer at page
 (18) 314 beginning at line 23 and then extending down over to page
 (19) 315
 (20) Yes not only between me and Dr Spies but probably more
 (21) importantly between the fisheries scientists who are peer
 (22) reviewers and Dr Spies That I think is based upon a concern
 (23) for the way in which – well let me step back
 (24) Dr Spies and I have similar background which is a
 (25) background as benthic ecologists dealing mostly with the
 seafloor and animals and plants that live and interact with

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- (1) the seafloor Neither of us is fundamentally a fisheries
 (2) population dynamicist Yet we both read that literature and
 (3) are aware that one of the basic fundamental analyses of
 (4) fisheries population dynamics is an attempt to look at stock
 (5) recruit and recruit spawn or recruit relationships That is to
 (6) say relationships between the numbers of spawners and the
 (7) number of recruits that you get in the next generation and the
 (8) number of recruits that you have in that population and how
 (9) many will grow up to be adults so as to model those
 (10) populations Neither of us is experienced in that sort of
 (11) modeling and I have a feeling that Dr Spies is more suspicious
 (12) of the results of those modeling efforts than I am And that
 (13) in part is based upon my reliance on the peer reviewers such
 (14) as people like Brian Rothschild and Phil Mundy and Ray
 Hilborn
 (15) who have been involved with evaluating these salmon
 questions
 (16) from the beginning and who are some of the most top notch
 (17) fisheries population dynamics modelers in the business You
 (18) give that answer in part at your deposition?
 (19) A Yes I ve been following that along and it conforms with
 (20) my memory as well
 (21) Q Now also do you profess any expertise as a hydrocarbon
 (22) chemist?
 (23) A No I do not
 (24) Q Do you profess any expert see – well let me ask it this
 (25) way

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- (1) Do you profess any expertise on specific petroleum
 (2) toxicology mammals birds animals or is it mammals or birds?
 (3) A I don t know that I understand What do you mean by
 (4) specific petroleum toxicology
 (5) Q Well do you profess any expertise on the petroleum
 (6) toxicology on mammals birds algae or as a matter of fact
 (7) marine invertebrates?
 (8) A I m not a toxicologist but I serve in many ways as the
 (9) vice chairman of our environmental management commission
 that
 (10) has as one of its mandates to understand toxic emissions into
 (11) the environment I ve been the ad hoc chair of the biotoxicity
 (12) monitoring committee established by that commission to
 address
 (13) toxicity I ve also served as I mentioned I think earlier
 (14) served to review the environmental toxicology programs of EPA
 (15) the marine benthic environmental programs of the EPA I
 (16) understand toxicology and look at it in the context of the
 (17) broader ecosystem and in that sense I have familiarity with
 (18) petroleum and its toxicological effects
 (19) MR SANDERS May I approach again Your Honor I
 (20) apologize I didn t realize we would get so deep into this at
 (21) this juncture
 (22) BY MR SANDERS
 (23) Q This is another volume of your deposition look at page
 (24) 488 beginning with line 1 I m going to skip over the
 (25) objection that s made to the question I m going to read the

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- (1) question and answer beginning at 488 line one
 (2) Question What are the types of hydrocarbons that are most
 (3) toxic according to the literature
 (4) Answer I don t profess an expertise on the specific
 (5) petroleum toxicology on mammals birds algae or as a matter
 (6) of fact marine invertebrates except to the degree that I read
 (7) broadly the toxicological literature relative to oil as they
 (8) apply to the marine invertebrates that I also study
 (9) Was that question asked and answered given under oath?
 (10) A Yes I think that s what I was trying to say except maybe
 (11) I was trying to say it more clearly here
 (12) Q My choice is the former I didn t understand the other part
 (13) you gave
 (14) Do you have any personal experience firsthand experience
 (15) in studying oil spills?
 (16) A Yes I do At this point five years of studying oil
 (17) spills One oil spill in particular with a month and a half to
 (18) two months of my life devoted to that study
 (19) Q That was in Santa Barbara?
 (20) A No I was referring to the last five years from the Exxon
 (21) Valdez oil spill
 (22) Q Well how many days did you actually spend in Prince
 (23) William Sound or the Alaska Peninsula?
 (24) A I ve spent approximately eight days in the field in that
 (25) system

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- (1) Q In five years?
 (2) A That s correct
 (3) Q Have you made any comparison of the recovery in Prince
 (4) William Sound rigorously compared to other spills?
 (5) A I have definitely read the literature as it has been
 (6) produced from other spills by rigorous comparison I don t
 (7) fully know what you mean but it s part of what a number of us
 (8) do is to examine this spill in the context of what we have
 (9) known from previous events
 (10) Q Dr Peterson would you look at page 382 of your
 (11) deposition Again line 1 Was the following question asked
 (12) and the following answer given by you
 (13) Question Have you personally made a comparison of the
 (14) recovery in Prince William Sound rigorously compared to other
 (15) spills
 (16) Answer I have not taken the data or been involved in a
 (17) study which took the data and then compared that information
 (18) to similarly collected information on similar components from the
 (19) results of other spills no
 (20) Was that question asked and the answer given by you?
 (21) A Give me a moment to try to find it
 (22) Q I m sorry I thought you had found it or I wouldn t have
 (23) started reading it to you
 (24) A 382
 (25) Q Can I help you?

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- (1) A Got it thanks
 (2) MR SANDERS Shall I read it again Your Honor?
 (3) THE COURT Let s see
 (4) THE WITNESS Yes I have found that and that
 (5) conforms with my recollection
 (6) BY MR SANDERS
 (7) Q That s your answer?
 (8) A Yes although I take opportunity as I have here to point
 (9) out exactly what I have done both prior to then and since then
 (10) which is put what we have learned from our five years of work
 (11) on the Exxon Valdez oil spill into a context of what we know
 (12) from previous oil spills
 (13) Q Now going back to your seven or eight days I think you
 (14) said eight days in Prince William Sound you actually took two
 (15) trips correct?
 (16) A That s correct I was able to visit the Sound and the
 (17) system twice
 (18) Q Once in 91 July correct?
 (19) A Yes I think that s correct
 (20) Q And that was for four or five days?
 (21) A I think I was able to spend the bulk of three days on that
 (22) trip in the Sound but I would have to check my notes
 (23) Q And then the next time was two years later in September of
 (24) 1993?
 (25) A That s correct

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- (1) Q And you did that you suggested that you ought to do that
 (2) to one of the plaintiffs lawyers Mr Rossbach is that
 (3) correct?
 (4) A That s part of the reason why I took that trip
 (5) Q Now going back to your - to your involvement in the
 (6) trustee studies as a peer reviewer - let me ask you this
 (7) clarification question Dr Peterson
 (8) In the trustees studies or in any project like this there
 (9) are primary investigators correct and then there are peer
 (10) reviewers and then there is a whole chain of people who are
 (11) involved in a project like this correct?
 (12) A Yes I think we tend to call them principal investigators
 (13) but I think you probably have the same meaning that I would
 (14) have
 (15) Q I take your correction thank you Principal
 (16) investigators And those people are people who do scientific
 (17) studies correct?
 (18) A That s correct Those are the folks who are funded to go
 (19) out and do that research
 (20) Q And they do the field studies and the field analysis
 (21) correct?
 (22) A That s one characteristic of the research that they do
 (23) There are in addition laboratory studies that make up part of
 (24) the program and there are intellectual studies whereby science
 (25) is funded for people to sit in their office to look at data

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- (1) that have come from field and lab and to understand exactly
 (2) how those data fit together
 (3) Q And at least in the trustees studies that we ve been
 (4) discussing and that you discussed earlier with your counsel
 (5) you have been a peer reviewer and not a principal investigator
 (6) is that right?
 (7) A That s correct The role of peer reviewer is one whereby
 (8) we are asked to come in and examine these programs examine
 (9) the
 (10) quality of the work whether it s done well whether it s
 (11) complete but not be funded by the work so that we don t have a
 (12) bias based upon the fact that we might be getting money for the
 (13) project that we re working to look at So there is a
 (14) separation between the peer reviewers and the principal
 (15) investigators based upon that avoidance of a conflict of
 (16) interest
 (17) Q And prior to your involvement in the Exxon Valdez oil
 (18) spill your only experience in an oil spill direct experience
 (19) of doing anything in connection with an oil spill was in Santa
 (20) Barbara in 1969 correct?
 (21) A That is correct if you restrict it to oil spills if you
 (22) are asking a question about understanding the impacts of oil on
 (23) ecosystems there is much much more
 (24) Q Well tell me about what you did in Santa Barbara in 1969?
 (25) A Santa Barbara in 1969 I had just left college and had
 begun to do my research I had a research site and a problem

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- (1) picked out when the blowout occurred some miles off the coast
 (2) The oil came in and actually entered the estuary I was working
 (3) in and where my research was being conducted As a
 consequence
 (4) there was actually some manipulation to close that estuary off
 (5) and the project that I had initiated there was no longer
 (6) feasible because of the impact of the spill and the oil on the
 (7) system that I was looking at initially I could have done a
 (8) different one but not the one I started Then I actually took
 (9) part in some of the recovery of oiled birds notably Grebe and
 (10) took them to the recovery center I flew over the spill in
 (11) some of its initial stages with the context in mind of looking
 (12) at the transport and the physical dynamics that were moving the
 (13) oil on the sea surface and then I subsequently worked to help
 (14) review some of the science studies notably by Dr Dale Strong
 (15) who had worked to evaluate the impacts of the spill through
 (16) field work following it
 (17) Q Did you become familiar with his work concerning - that s
 (18) a her isn t it?
 (19) A Yes it s a lady
 (20) Q Did you take part in any of the assessment with respect to
 (21) the recovery of fish after the Santa Barbara blowout?
 (22) A No I did not
 (23) Q Did you do any rigorous scientific study to assess the
 (24) biological damage to fish resulting from that direct or
 (25) indirect?

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- (1) A I have trouble answering because of what seems a
 (2) misunderstanding Scientific study does not merely mean the
 (3) hands on work in the field but rather it means taking
 (4) information that is available and evaluating that That part
 (5) of it I was involved in The actual hands on work in the
 (6) field I was involved in to the extent of as I mentioned of
 (7) recovery of oiled birds but not the science portion that I
 (8) then subsequently was a reviewer of
 (9) Q Your job as a - were you serving on the board of the
 (10) fisheries in North Carolina?
 (11) A North Carolina manages its fishery the way many states do
 (12) and that is to say there are boards appointed largely by the
 (13) governor although there are other mechanisms whereby
 (14) people
 (15) become appointed to these boards my appointments have
 (16) been by
 (17) the governor and I served a past term on that board and I
 (18) serve presently on that board and our charge is to manage all
 (19) the marine fisheries of the state
 (20) Q And what marine fisheries what species of fish are
 (21) involved in North Carolina fisheries?
 (22) A It s a long list
 (23) Q Do any of them include salmon?
 (24) A No we do not have salmonets in North Carolina
 (25) Q And they don t include herring?
 (26) A No we do not have herring in North Carolina
 (27) MR SANDERS Your Honor that concludes my voir

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- (1) dire Given the breadth I think in the field that has been
 (2) previously discussed with the court and somewhat perhaps
 (3) clarified by the voir dire this gentleman is certainly
 (4) entitled to testify in his area of focus as a benthic
 (5) ecologist Beyond that I don t think there is anything in the
 (6) examination other than generalities which would give us a
 (7) handle frankly don t know whether he s qualified to go beyond
 (8) that and I don t think the offer gives us that information
 (9) too general
 (10) THE COURT I will accept the qualifications of the
 (11) witness as a marine ecologist
 (12) MR JAMIN Thank you very much
 (13) THE COURT If another problem develops in terms of
 (14) what you re suggesting Mr Sanders call it to our attention
 (15) MR SANDERS I ll try to Your Honor
 (16) MR JAMIN Thank you Your Honor
 (17) CONTINUED DIRECT EXAMINATION OF CHARLES
 PETERSON
 (18) BY MR JAMIN
 (19) Q Dr Peterson let s get on to the substance as quickly as
 (20) we can
 (21) I d like you to use your teaching skills a little bit and
 (22) I want you to be sensitive to the courtroom We have to do
 (23) things in a question and answer sequence but I d like you to
 (24) give the jury an idea of the general nature of the near shore
 (25) ecosystem in Prince William Sound and the northern Gulf of

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- (1) Alaska and in connection with that have you asked us to
 (2) develop a demonstrative exhibit which represents a portion of
 (3) the coastal shoreline in Prince William Sound?
 (4) A Yes I thought that would be a good teaching aid
 (5) Q Let me just show you this for identification first is
 (6) this that exhibit sir?
 (7) A Yes it is
 (8) MR JAMIN Your Honor I d like permission to show
 (9) this to the jury and Dr Peterson
 (10) BY MR JAMIN
 (11) Q And sir in the interest of not confusing counsel or
 (12) members of the jury I m going to give you a pad and as we
 (13) come to words that you think might be problematical please
 (14) feel free to write them down although I m probably going to
 (15) interfere with the person who needs to have the spellings the
 (16) most our court reporter
 (17) Now let me get an idea first of the general nature of the
 (18) ecosystem Can you describe it for us?
 (19) A Yes I think the generality that I would like to make to
 (20) begin this and then I will flesh it out with the specifics as
 (21) I go along I think it s appropriate to generalize that the
 (22) Prince William Sound and Northern Gulf of Alaska coastal
 (23) ecosystem is an unusually highly productive ecosystem with
 (24) especially - special significance for the amount of that
 (25) productivity that makes its way into the higher level predators

(1) and consumers in the ecosystem mainly the fish birds and
 (2) mammals
 (3) Q In describing the ecosystem is it appropriate to divide it
 (4) at all geographically?
 (5) A I d like to walk around so I don t mind where you put it
 (6) Q It s going to be like a large classroom discussion
 (7) A It will
 (8) Q With respect to the division is there an appropriate
 (9) division to make for ease of explanation?
 (10) A Yes I think that the typical way that scientists would
 (11) partition this system so as to talk about it is to talk about
 (12) the intertidal zone the subtidal zone and the water column
 (13) or the pelagic zone and I ve used a word already so I think I
 (14) might have to leap up and write it down
 (15) MR JAMIN With the court s permission I m going to
 (16) ask if Dr Peterson may use the exhibit and the board
 (17) THE COURT Let s try it
 (18) MR JAMIN Very well Thank you Your Honor
 (19) THE WITNESS I mentioned a word and I ll spell it
 (20) pelagic which basically means the water column I ll use a
 (21) few more as I go along and I will apologize once and not again
 (22) in that there is some terminology that I think I need to use
 (23) and I ll keep it to a minimum
 (24) BY MR JAMIN
 (25) Q You mentioned an intertidal zone can you explain to us

(1) adaptable I first need to define these
 (2) Intertidal is spelled up here Inter meaning between the
 (3) tides and the intertidal zone is that part of the shoreline
 (4) that we usually call the beach It runs from the top of the
 (5) tide mark where the tides reach the stop of the shore to the
 (6) bottom of the shore and that zone is the intertidal zone So
 (7) I start first with that explanation
 (8) The intertidal zone is an exceptionally productive zone
 (9) because it falls at the interface of three major sorts of
 (10) systems the air the ground and the water In other words
 (11) the intertidal is where all three of these come together and
 (12) as an interface like many biological interfaces where systems
 (13) come together it s very highly productive
 (14) Q Let me ask you what role does the land element have in
 (15) this system?
 (16) A The land provides space for the organisms to attach to
 (17) And these organisms are both plants and here up front we see
 (18) a
 (19) long line of fucus which is that plant which is the basic
 (20) seaweed of the intertidal zone rockweed or popweed We have
 (21) a
 (22) long zone of fucus and for animals so both plants and animals
 (23) attach to space in the intertidal zone and space is actually
 (24) limited in many areas at many times in that zone so they
 (25) compete for space There is not infinite amount of it and
 they compete for space especially at the mid and lower zones
 of the tide The land also serves another function and that

(1) with reference to the chart what that is sir?
 (2) A Yes I will and I will and let me say first while I
 (3) think it s appropriate and customary to divide the environment
 (4) up into these three pieces the coastal ecosystem really works
 (5) as a whole and so after I ve talked about the three pieces
 (6) and how they differ and the processes that go on in them after
 (7) I do that I ll pull it all back together and tell you how it
 (8) works together So I begin by that
 (9) MR SANDERS Your Honor I m going to object to this
 (10) narrative form of doing things If counsel can ask him
 (11) questions and he can answer I can keep up and know whether
 (12) I m
 (13) supposed to object For him to get a question and give a
 (14) speech I think is going to be hard
 (15) MR JAMIN I m sensitive
 (16) THE COURT We re all right so far but please do it
 (17) in a question and answer format
 (18) THE WITNESS Can you repeat your question?
 (19) BY MR JAMIN
 (20) Q I will do that Let s do this let s get an idea of how
 (21) this first part of the ecosystem functions the intertidal
 (22) area and sensitive to Mr Sanders concern and Your Honor
 (23) let s not go more than a minute or a minute and a half with
 (24) regard to that
 (25) A Thank you and I won t be sensitive if I m told to break it
 up it s different from how I normally do it but I m

(1) is the land is the source of run off carrying nutrients by
 (2) nutrient the phosphates the nitrates that grows plants and
 (3) the land serves as a source of those nutrients which run off
 (4) through rivers glacial ice melt and other water sources into
 (5) this zone and fertilize the plants that you find in the zone
 (6) Q What role does the water play in the intertidal zone?
 (7) A The water plays the role of bringing those nutrients into
 (8) shore and for the animals that live in these intertidal zones
 (9) the small plants the plankton of the sea And I ve used
 (10) another word which I ll write down plankton These are small
 (11) plants and animals transported by currents so these are so
 (12) small that they can t swim against the currents and there are
 (13) two types both of which will come up soon so it s appropriate
 (14) to tell you phytoplankton has that prefix phyto and those
 (15) are the plant plankton they are single celled algae And the
 (16) other type of plankton is the animal plankton or the
 (17) zooplankton Call them small animals I ll talk more about
 (18) that in a moment
 (19) The answer to your question involves not only the plants
 (20) that live here which require the nutrients to be brought into
 (21) them by the water but the animals that are feeding on
 (22) phytoplankton which require those phytoplankton to be
 (23) brought
 (24) in by water So the answer to your question is the rise and
 (25) fall of the tides in combination with the currents provides
 an energy subsidy into this zone for both the plants and

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- (1) animals that you find attached there to grow and so that rise
 (2) and fall and in this zone we have tides of ten to 15 feet
 (3) substantial tides That water and those tides and the physics
 (4) of those tides brings energy into this zone
 (5) Q What role does the third element the air play in this
 (6) intertidal zone?
 (7) A The air is the medium for the passage of sunlight and
 (8) sunlight is the source of energy for the plants to grow on
 (9) which ultimately means for the animals to grow on when they
 (10) eat
 (11) the plants
 (12) Q You've mentioned fucus what are the most important plants
 (13) in this zone?
 (14) A Fucus is without question the most important plant and by
 (15) importance it's important in the sense of the biomass of how
 (16) much plant it's producing and growing Fucus is the plant that
 (17) contributes the bulk of the biomass that's being grown in this
 (18) zone but fucus has several other roles besides the production
 (19) of plant material that ultimately animals can eat It forms a
 (20) habitat in and of itself and if I might show one of the
 (21) pictures if that's possible to bring up I can give you an
 (22) idea of the way that fucus creates three dimensional structure
 (23) off of otherwise what would be a rock surface
 (24) Q Dr Peterson I'm going to try to have this brought up on
 (25) the television I think it's available now
 (26) A Thank you If you could take a glance at the screen I

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- (1) think really that there is little I need to do here to augment
 (2) what you see
 (3) What you see is in the foreground a large extent of fucus
 (4) that I think illustrates nicely it's three dimensional not to
 (5) mention also its abundance and the coverage of the zone but
 (6) the three dimensional comes nicely off the picture and that
 (7) was the purpose of showing you this
 (8) Q Now you were going on to explain some of the importance of
 (9) fucus in the intertidal zone?
 (10) A I was First of all there is an importance to the
 (11) production of fucus that would fuel the food chain provide
 (12) food and that is important The fucus is eaten directly by
 (13) grazers these are plant eaters or herbivores and that
 (14) probably is the next term that I can't escape the herbivores
 (15) are the plant eaters the rabbits if you will of the seas The
 (16) fucus helps fuel that and interestingly the fucus does that
 (17) largely by what is called the detritus food chain that means
 (18) that the plant is shed the word is detritus and that equals
 (19) dead plant and animal matter and most of it being plant but
 (20) there is more plant to cast out the fucus sheds these leaves
 (21) the leaves go offshore and settle to the seafloor where they
 (22) fuel the production of animals so that's the one function that
 (23) the fucus plays The function of the fucus as habitat is
 (24) manifold The fucus first of all provides habitat for laying
 (25) of herring eggs Herring lay their eggs on fucus as well as on

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- (1) other plants in the subtidal zones The intertidal zones
 (2) the fucus is an important source for herring to lay their eggs
 (3) it's a bed for herring eggs for about three weeks while they
 (4) are developing That's one type of habitat role that fucus
 (5) plays Then fucus plays a role in creating these three
 (6) dimensional spaces in which animals live and those spaces are
 (7) important because they provide shelter and they provide shelter
 (8) of two types Shelter from a rigorous environment and shelter
 (9) from potential enemies from predators that might eat you and
 (10) in that mode this system is a system that we call the nursery
 (11) environment for a variety of marine invertebrates and fishes
 (12) including pink salmon and herring Now I've got to - another
 (13) word I used was invertebrates Invertebrates means animals
 (14) with no backbone basically things like snails and worms and
 (15) so forth
 (16) The intertidal habitat is where at high tide the water is
 (17) up here low tide down here and these plants and animals that
 (18) occupy the intertidal zone are effectively marine so that when
 (19) they are hung out here to dry at high tide it's a rigorous
 (20) environment they are waiting for water coverage to produce
 (21) again and become comfortable putting it in an
 (22) anthropomorphic
 (23) terminology so fucus plays an important role because it
 (24) retains moisture and consequently it shelters these animals
 (25) that live among it from desiccation from drying out when they
 (26) are exposed to the wind and the sun so that's an important

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- (1) role and it provides structure and interference with larger
 (2) predators so the nursery function can condition These fish
 (3) can live among it and not be eaten by the consumers the
 (4) enemies that they face I think that is the complete answer
 (5) Q We've focused on the vegetable part of it let's go to the
 (6) animal part a little bit and get a sense of what important
 (7) animal groups exist in this intertidal zone?
 (8) A This picture from some distance and I should say this is a
 (9) protected rocky shore on Eleanor Island that's the context
 (10) here this picture from some distance doesn't give you a good
 (11) feeling for all the animals that are occupying this shore and
 (12) as a consequence I've got another slide that gives you insight
 (13) into the animals that you would see if we had a close up
 (14) Q That should be coming up on the television momentarily
 (15) Doctor Is that it?
 (16) A That's exactly what I had in mind
 (17) Q If you would like to use that to demonstrate some of the
 (18) animals that live in the intertidal environment?
 (19) A Thank you This is going to be helpful so I can give you
 (20) images to put with names of things and the first of those I
 (21) think had better be a barnacle and let me circle a barnacle
 (22) I've successfully done it You can see there are a lot of
 (23) them I could have circled several barnacles A barnacle is a
 (24) suspension feeder looks like a little volcano and it sticks
 (25) something up and grabs the phytoplankton as they come by
 (26) and

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(1) that s how it makes a living
 (2) Let me circle a mussel next A mussel is very similar it
 (3) too attaches to the surface and waits for the tide to come in
 (4) and then filters out of the water the phytoplankton that come
 (5) by the same as the barnacle Here we have a single mussel
 (6) but mussels can live in large beds and assemblages as well
 (7) Now this picture we also have a snail that s a bit bigger
 (8) than those mussels and barnacles this snail I ve marked right
 (9) here and it s a predator called a drill and that s because it
 (10) does drill a hole through the shells of the barnacle or mussel
 (11) that it eats and that s two of tis most popular items So
 (12) here is one of the predators of the system
 (13) Another species of importance in this environment and I
 (14) won t name all of these but it s the periwinkle snail and
 (15) interestingly enough it s riding the back of one of the
 (16) drills The periwinkle is a grazer it falls into the rabbits
 (17) of the sea eating the plants and it s actually grazing the
 (18) small plants that are growing on the back of that snail in this
 (19) particular picture That s a periwinkle
 (20) Now there is one other sort of organism that is not well
 (21) illustrated in this picture but happens to be in it that s of
 (22) value for its abundance in the system one additional animal
 (23) I ve made a mess but there is a limpet up in that corner
 (24) limpets are also like little volcanos but moving little
 (25) volcanos they move through the shore and they too graze the

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(1) small algae just like the periwinkle so the limpet and the
 (2) periwinkle are snails they are snails and moves through that
 (3) system and grazes algae off of it So that and the periwinkle
 (4) are similar the barnacle and the mussel are similar in
 (5) catching phytoplankton food and the drill is a predator that
 (6) moves through that system These are the most important of
 (7) the
 (8) animals that you find in that intertidal environment there are
 (9) a lot of others but numerically in abundance those are the
 (10) most important and they too compete for space Space is the
 (11) limiting resource in that system and they compete for it in
 (12) that environment
 (13) Q Besides the animals that you have demonstrated to us from
 (14) the picture are there other important animals in that
 (15) intertidal zone?
 (16) A Yes there are I have taken the opportunity to have drawn
 (17) a schematic of this system up here that helps me put this into
 (18) some perspective and the intertidal zone serves as another
 (19) important habitat for eggs and that is the habitat for the
 (20) eggs of the pink salmon And this is meant to be an
 (21) anadromous
 (22) fish stream Anadromous fishes - I ll spell that one out
 (23) Anadromous fishes are those that are fish at sea as adults but
 (24) then come back to fresh water to spawn Marine fishes
 (25) spawning in fresh water and in Prince William Sound
 something
 (26) like 75 percent of the eggs of pink salmon are laid in gravel
 (27) at the mouth and intertidal gravel so in the intertidal zone

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(1) at the mouths of anadromous streams so that also is a key
 (2) piece for the bed of the salmon eggs like the fucus largely
 (3) in this zone is the bed for the herring eggs
 (4) Q Let s build now for the jury an idea of the second element
 (5) of the large system that you described the subtidal zone and
 (6) could you first define it for us?
 (7) A The subtidal and here I ve got it spelled out with its
 (8) prefix sub and tidal It s meant to be the seafloor from the
 (9) low water mark on down And if I can work it I ve actually
 (10) got a way to give you some insight into the subtidal zone and
 (11) what it looks like So it would start initiate at the bottom
 (12) of the intertidal zone and then the subtidal is from that
 (13) point on out into the sea
 (14) Q Can you explain how the subtidal ecology functions for us?
 (15) A Yes I can The subtidal zone has some limitations and
 (16) those are limitations in light in how much light reaches the
 (17) bottom Note the intense algae cover here on shore as well as
 (18) it goes through the sea water it attenuates so as you get
 (19) deeper and deeper in water there is less light reaching and in
 (20) fact the light that plants use to photosynthesize that light is
 (21) filtered as you get deeper so there is a narrow fringe of the
 (22) bottom of the seafloor where plants can grow so that s a
 (23) system where we ve got sunlight being turned into plant
 (24) energy Beneath that is the zone of the seafloor of the
 (25) subtidal system where there are not actually living plants but

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(1) there are animals the animals living off the detritus come
 (2) from the intertidal and this zone carried out deposited on
 (3) the floor where now they can be utilized to grow animals So
 (4) this system is typically divided into that shallow zone that
 (5) can grow plants and the deeper zone that cannot The width of
 (6) those zones depends upon the slope of the shoreline if it s
 (7) slowly he can get a big zone but if it s steep it s a narrow
 (8) one The plants that we find in that environment depend upon
 (9) the substrate type that we have there By substrate I mean the
 (10) bottom the bottom type I suppose I better write that one
 (11) since I said it
 (12) There are two basic types of substrate in this system that
 (13) make all the difference as to what sort of organisms plants
 (14) and animals you have One is sediments that means soils
 (15) effectively sands and muds the other is rock hard continuous
 (16) things and so we have soils and rock on the seafloor Where
 (17) we have soils in protected areas in Prince William Sound and in
 (18) this Northern Gulf of Alaska system there is a plant called
 (19) eel grass and I ve attempted to illustrate that with eel grass
 (20) and the seafloor to give an indication of the sedimentary
 (21) nature of it We have a plant called eel grass that grows up
 (22) in those environments Where we have rocky bottoms to the
 (23) coastline in the Prince William Sound and northern gulf system
 (24) in the zone where light can penetrate we have large sea weeds
 (25) growing up sea weeds that we call kelps there are three

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- (1) different major kinds of kelps that I won't bore you with but
 (2) they live in slightly different habitats intermingled but
 (3) they like the fucus like the sea grass the eelgrass here
 (4) serve multiple roles in the ecosystem
 (5) Q What are those roles Doctor?
 (6) A The roles are very similar they produce the green plant
 (7) material that then fuels the larger detritus based system in
 (8) the seafloor and around in the coastal zone and the production
 (9) of these plants is in fact the major mechanism by which we get
 (10) plants into this zone and animals growing It is a very
 (11) significant combination and is a major mechanism of driving
 (12) this system Secondly these plants provide the bed for
 (13) herring to lay their eggs on This is the bed for the eggs in
 (14) the subtidal So herring not only lay their eggs on the fucus
 (15) in the intertidals and intertidal algae but back here you can
 (16) see that there are other algae on the seafloor in the
 (17) intertidal zone and these include red algae greens and browns
 (18) but herring also lay their eggs on eelgrass and the kelps so
 (19) they provide the bed for those eggs to lay on then the nursery
 (20) habitat the same function of providing a structure rising off
 (21) the seafloor with spaces and a habitat that would not exist in
 (22) the absence of those plants is created in that environment by
 (23) all these plants That habitat is the nursery habitat for a
 (24) variety of fishes including early stages of the pink salmon
 (25) after they re emerge from the streams and of the herring It

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- (1) also is a habitat where there are special plant related
 (2) organisms that live among it
 (3) Q What are they?
 (4) A These plant related organisms tend to be - these plant
 (5) related organisms are dominated by crustaceans Crustaceans
 (6) are the group that includes crabs and shrimp These are the
 (7) things that are kind of like the bugs of the sea Insects of
 (8) the sea if you want bugs of the sea you'll know what I mean
 (9) and in particular these include amphipods amphipods are tiny
 (10) little things with a lot of little legs there is a whole
 (11) variety of groups of those They include isopods they include
 (12) a group and this is a double name called harpacticoid
 (13) copepods and harpacticoid copepods I won't draw any
 (14) differently but if we were sitting by a microscope I would
 (15) These are invertebrates that are attached to the plants and
 (16) live on the plants and are there because of the plant
 (17) environment and so we call them phyto or plant associated As
 (18) well there are fishes that live in that habitat typically
 (19) these are juvenile fishes using it as the nursery this is the
 (20) home for those fishes It's a home because it has prey
 (21) including these animals that are being grown and because it
 (22) has protection from predators in that system So this is the
 (23) home and the nursery for a variety of fishes and that includes
 (24) especially at the early stages of pink salmon and herring
 (25) Q All right Let's take a moment to get an idea of that

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- (1) third element that you described of this nearshore ecosystem
 (2) the water column zone And first do ecologists divide the
 (3) water column separately into different sub parts or zones?
 (4) A Yes
 (5) Q What are they?
 (6) A Let me just point out that on this diagram I have attempted
 (7) to illustrate the water column by pointing out where it sits
 (8) over here The water column can be and traditionally is by
 (9) ecologists divided up into three different zones First there
 (10) is a very narrow surface layer exceedingly narrow surface
 (11) layer and that is the neuston zone That is a habitat where
 (12) water tension is high It's a habitat where there are numerous
 (13) microbial organisms and small very small animals including
 (14) the eggs floating eggs of some fishes such as the cod and
 (15) including the larvae an early organisms after - I guess I've
 (16) used a new term haven't I we know what larvae are it's a
 (17) developmental stage that comes after the egg and a lot of
 (18) invertebrates and fishes have larvae in common so it applies
 (19) to both things like a barnacle interestingly and it applies
 (20) to things like herring they both have larvae The neuston is
 (21) a zone where numerous larvae of marine organisms are found
 (22) especially the newly hatched shrimps and crabs are commonly
 (23) a
 (24) member of the neuston so that is the narrow surface film zone
 (25) of the sea
 (26) Then we identify a second zone and this won't come as a

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- (1) surprise the zone where the light penetrates because in this
 (2) system the phytoplankton cells as well can only grow where
 (3) light penetrates so we define an upper ocean as the a zone
 (4) where the plants can grow and then there is a subsequent zone
 (5) of the water column that is deeper where light doesn't
 (6) penetrate for plant growth but it's not one that has no
 (7) animals because there is this rain of particles that are good
 (8) to eat if you're so inclined there is this rain of particles
 (9) that's coming down from this lighted zone so there are animals
 (10) that live in the third zone as well
 (11) Q Now Doctor you've explained how in the intertidal zone
 (12) and the subtidals there is particular importance to salmon and
 (13) herring Is there anything significance in the neuston or the
 (14) lower part of the water column which is of importance to those
 (15) species?
 (16) A Yes there is Pardon for a minute There is The small
 (17) algae are quite productive these phytoplankton these single
 (18) celled algae They reproduce quite rapidly in this zone and
 (19) they form the food for the zooplankton Zooplankton is the
 (20) animal plankton that eat and feed on the phyto so the phyto
 (21) and zooplankton are coupled - to get a good amount of
 (22) zooplankton you need to have phyto and they turn over
 (23) quickly
 (24) they form the food stuffs for the larval fish so the water
 (25) column is a system where we have phytoplankton eaten by the
 (26) zooplankton and then eaten by larvae fish and filter fish in

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- (1) some cases whales but that's a different story
 (2) Q I think we have a fairly good system and for some of us
 (3) more than we ever wanted to know about the near shore
 (4) environment but let's try to build on what we've learned so
 (5) far Doctor and get an idea and I think you've mentioned the
 (6) word of the interrelated food web which we find in this
 (7) environment and would it be of assistance to have a clean
 (8) board for that as if it were a blackboard?
 (9) A Yes if I were to draw it on the paper I think it would be
 (10) too small Thank you
 (11) Q All right
 (12) A What I've been speaking of until now is these habitats the
 (13) intertidals the subtidals and then the water the three
 (14) different systems and I've talked about how they work a bit
 (15) differently and the role they play for fish production in the
 (16) nearshore ecosystem A traditional way that ecologists tell
 (17) you more and tell you who eats whom and gives you an idea of
 (18) the system is to make what we call a food web and you'll see
 (19) why I call it a web soon
 (20) A food web is comprised of several food chains where the
 (21) chain is the link between the prey the food and the thing that
 (22) eats it and so that's really what I'm going to do I'm going
 (23) to draw you a rather general food web north Prince William
 (24) Sound Northern Gulf of Alaska coastal ecosystem I'm not
 (25) going to do anything like putting all the plants and animals in

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- (1) it There are for example something like 140 different
 (2) species of sea weeds that I might be able to enter into this
 (3) system and I'm not going to do that but I'll characterize
 (4) things and group them together to give you an idea of the major
 (5) groups and the major species and the relationships that they
 (6) play to their food and to their enemies to their consumers
 (7) and that's what a food web is all about It starts with the
 (8) sun as the source of the energy for the system And we
 (9) typically do this by having the lower levels be the sun the
 (10) next level being the plants the next level being the plant
 (11) eaters or herbivores the next level being the predators that
 (12) eat those herbivores and so on But the sun is what begins
 (13) it There is the energy to which are added plant nutrients
 (14) which are the fertilizers for plant growth so that's what
 (15) begins it Now I'm going to categorize the plants into four
 (16) different types realizing that I'm putting many plants
 (17) together in doing that
 (18) The first one is going to be macro algae and by macro
 (19) algae what I mean is fucus in the intertidals as we've talked
 (20) about or rockweed or popweed as an example Sea weeds of
 (21) all sorts Kelps of which we've got an example there and sea
 (22) grass These are one type of plant in the system Now I've
 (23) got to apologize for those of you who know more biology than I
 (24) do sea grass is actually a flowering plant and we don't
 (25) usually call it an algae but I've lumped it here because it's

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- (1) a big plant that performs the same role it's a flowering plant
 (2) that's invaded from land Then there is the phytoplankton of
 (3) which I've spoken already There are numerous numerous
 (4) species of single celled algae Then I'm going to put plant
 (5) detritus as a separate category knowing that that comes largely
 (6) from this
 (7) Now I'm using a convention here that I need to explain and
 (8) that is when I draw an arrow it means that energy is flowing
 (9) from one of these compartments boxes circles to another one
 (10) So in this case the arrow means not that energy is flowing but
 (11) these are the producers of the materials which forms the
 (12) detritus on which so many things will depend and then finally
 (13) there is a smaller box for what I'm calling benthic micro
 (14) algae that required me to use another term which you've heard
 (15) earlier but hasn't been defined Benthic means on the bottom
 (16) Q So these four then are that first layer?
 (17) A These four are the first layer of the thing that takes
 (18) sunlight and turn it into energy better known as plants
 (19) Q What's the next layer up in the food web?
 (20) A The next layer up are the herbivores
 (21) Q Those are the plant eaters?
 (22) A Yeah and I think you might want to know those as plant
 (23) eaters And again I'm not going to go through and detail every
 (24) herbivore in the system but I'll name the most significant
 (25) ones and group them together in some meaningful fashion that

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- (1) gives you a feel for this There are those ones you have seen
 (2) on the CD ROM limpets periwinkle snails I'll draw a box for
 (3) them These make a living by grazing these macro algae often
 (4) by grazing them before they get big Once they get big it's
 (5) hard for one of these little things to graze through although
 (6) they can do a job in some cases but they graze on the macro
 (7) algae before they have gotten macro and they as well consume
 (8) the benthic micro algae These I forget to describe Benthic
 (9) means they are on the bottom and micro single cell just like
 (10) the phytoplankton but unlike the phyto they don't live on the
 (11) bottom they stay (indicating) So that's where the limpets
 (12) and periwinkles make a living
 (13) You saw a picture of a very invertebrate the barnacles
 (14) They are fed by phytoplankton You saw another the mussels
 (15) those too are phytoplankton eaters so they are quite similar
 (16) There is another important group sea urchins Sea urchins
 (17) concern these macro algae There is another group of some
 (18) importance in this system as herbivores I'm going to call them
 (19) suspension feeding clams and as examples going to tell you
 (20) that these include all the clams on which there are fisheries
 (21) little neck butter razor several others Now those animals
 (22) as well are herbivores largely feeding from the
 (23) phytoplankton
 (24) I've talked already about zooplankton so you can
 (25) anticipate my next box and you anticipate where its energy

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(1) comes from which is energy from the phytoplankton Also then
 (2) are these phytol invertebrates that I mentioned which include
 (3) such things as some amphipods isopods and others These
 (4) phytol invertebrates are fed in part by the macro algae that
 (5) they live among The macro algae mostly form their home their
 (6) habitat but there is some consumption of macro algae by these
 (7) groups and there is some consumption of plant detritus and
 (8) benthic micro algae by those groups and finally we have the
 (9) soft sediment this means in the muds and sands soft sediment
 (10) invertebrates These include things like poly eat worms (ph)
 (11) soil s a place where you expect to find worms even in a marine
 (12) system Some soft shelled clams Other amphipods and a
 (13) great deal of other tacits fall in this group This is a group that
 (14) I will call the depositors as a label for what they are and
 (15) that s because these are eating the plant detritus and the
 (16) benthic micro algae which are deposited on the seafloor they
 (17) are on the seafloor That distinguishes it and those groups
 (18) from the suspension feeding clams barnacles and mussels
 (19) and barnacles and mussels are going hungry - no they have their
 (20) do here That distinguishes it from others but these are
 (21) all feeding on the phytoplankton in the water column so they
 (22) are filtering Whereas this group of deposit feeders that I ve
 (23) indicated here is feeding upon material on the seafloor
 (24) Q All right Now they re a part of the food web Doctor
 (25) that s above the herbivores and to some extent the -

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(1) A Yes
 (2) Q What are they?
 (3) A They are what we typically call primary or I ll use that
 (4) to indicate it predators The predators being those animals
 (5) that are eating the plant eaters and I ll indicate a number of
 (6) those that are most important in this system and again I ll
 (7) group them together so we don t have an infinite number of
 (8) these but rather just a few
 (9) One that you ve seen already and is of some importance so
 (10) it s appropriate to draw is the drills They drill barnacles
 (11) and mussels largely Another that I might put up here would be
 (12) the dungeness crabs Dungeness crabs are feeding on
 (13) on suspension feeding clams and on these soft sediment
 (14) invertebrates in large measure Then I m going to add up here
 (15) larval and juvenile herring Larval and juvenile herring feed
 (16) on zooplankton and the small zooplankton these are such
 (17) small animals after they have just hatched from the egg they can t
 (18) take a large zooplankton they take a small zooplankton There
 (19) are a group of plant associated fishes juvenile cod that you
 (20) find in this system as abundant predators They are being fed
 (21) by the phytol invertebrates amphipods and isopods
 (22) Finally let s put larval and juvenile pink salmon into
 (23) this puzzle to show you where they fall Larval pinks
 (24) juvenile pinks are mostly eating the zooplankton also eating
 (25) the amphipod isopods that come from the phytol group and this

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(1) phytol group includes another I should mention by name which
 (2) unfortunately is another long word the harpacticoid copepods
 (3) It s a group of bugs it s a little bit different from the
 (4) other group of bugs that s probably the best way to treat them
 (5) for our purposes Where do we have this And then the
 (6) amphipods from this soft sediment environment are also prey
 (7) for
 (8) the larval and juvenile pinks
 (9) Q Now once again is there a higher level and beginning to
 (10) focus more on salmon and herring in higher stages that is
 (11) important in this food web sir?
 (12) A Yes there is And now we get to where the adult fishes
 (13) come in Before I deal with the fish let me call these upper
 (14) level which is secondary predators as a type and these will
 (15) include such things as the sea otter Sea otter eats mussels
 (16) dungeness crabs sea urchins and clams in the Prince William
 (17) Sound and our spill affected region
 (18) Then we ve got adult herring to place in this puzzle
 (19) Adult herring likewise feed on zooplankton like the juveniles
 (20) but they feed on bigger ones as they get bigger it s a bigger
 (21) prey standard ecological pattern So adult herring fall into
 (22) that range I should add into this puzzle another box at the
 (23) previous level that I ll call other forage fishes Forage
 (24) means something that you eat so these are fishes that really
 (25) get chomped on they are part of a fish based ecosystem that is
 feeding a lot of birds and mammals and other fishes

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(1) And by other the herring is part of this these other
 (2) forage fishes these types that we are talking about here are
 (3) capelin and sandlance predominantly and these are
 (4) zooplankton
 (5) feeders Now I ve got my adult herring in the puzzle I don t
 (6) yet have adult pink salmon Should add one other line here
 (7) too and that is adult herring feed upon the juveniles there
 (8) is cannibalism in that species and we need a line that
 (9) connects those The adult pink salmon up here are eating
 (10) juvenile herring other forage fishes plant associated fishes
 (11) as well Interestingly these plant associated fishes have a
 (12) line that connects them to larval juvenile pink salmon so that
 (13) this complexity is enhanced and you might look at that and
 (14) think it looks like a mess but that is in fact a food web and
 (15) the purpose of drawing it was twofold One to tell you who ate
 (16) whom in the largest groups that we ve been talking about here
 (17) so you will you ll be able to put it in a context of the
 (18) broader coastal ecosystem and to see that it is a web with
 (19) arrows going from several boxes to several others
 (20) Q Now Doctor if there is a significant effect caused by any
 (21) number of things on one part of this system does that have
 (22) ramifications or one element of this system does that have
 (23) ramifications for the rest of the system?
 (24) A Yes Part of the reason for drawing a food web is to
 (25) understand how different species are interconnected in an
 ecosystem How they are not independent of one another
 Now

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(1) it's pretty straightforward you will be dependent on the prey
 (2) if food you're eating dependent on predators that are eating
 (3) you those are what we call direct interactions in food webs
 (4) and food chains and they exist in this system and are quite
 (5) important but in addition there are indirect interactions
 (6) These are one that are separated by one or two arrows away
 As
 (7) an event moves through the system and we call this cascading
 (8) of effects And cascading of these effects is best known in
 (9) the marine environment in this northern Gulf of Alaska
 (10) ecosystem that we're dealing with The example that describes
 (11) it best is one involving the sea otter and other components
 (12) here The sea otter is called a Keystone species Keystone
 (13) meaning it plays such a large role has effects that carry
 (14) through the whole salmon
 (15) MR SANDERS Your Honor let me interpose I think
 (16) we're getting far afield with sea otters
 (17) MR JAMIN We're going to connect it right up with
 (18) the next sentence
 (19) THE COURT I'm concerned that sea otters is not one
 (20) of the species that your plaintiffs deal with in this segment
 (21) of the case so -
 (22) MR JAMIN May I take just a second I think Dr
 (23) Peterson will explain how the sea otters are going to consume
 (24) sea urchins which create barrens at the lower levels and
 (25) effects the species to explain the notion of cascading it's

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(1) not my intent to go into sea otters as a damage element but
 (2) simply use it as a demonstration of the cascade
 (3) THE COURT Is it not possible to use an example that
 (4) deals with something that we're more interested with?
 (5) MR JAMIN I think you're - as soon as it goes back
 (6) up we're going to be very interested in everything that is from
 (7) the environment in which the fucus is found and in which the
 (8) seaweeds are found because they are both the home and the
 food
 (9) source for the species we're interested in
 (10) MR SANDERS I don't think that's the way he's going
 (11) to explain it but I'll withdraw the objection
 (12) MR JAMIN Thank you Your Honor
 (13) BY MR JAMIN
 (14) Q Please proceed
 (15) A We know the effect and the way that these effects cascade
 (16) through the ecosystem from sea otters because we've had
 (17) actually a huge experiment that we have done and followed
 (18) scientifically its outcome We as a society very nearly
 (19) exterminated the sea otter from the northern on south from
 (20) hunting and gathering pelts we over hunted it And around
 (21) 1912 we have put protections on and have now watched the sea
 or
 (22) the population return And we've had a unique opportunity to
 (23) look at these systems with and without sea otters The sea
 (24) otters has as its preferred prey the sea urchin in the
 (25) absence of the sea otter the urchin population grows it

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(1) doesn't happen overnight but sea urchins grow and they
 (2) overgraze their food and what they are grazing on are these
 (3) kelps and seaweeds in the shallow subtidal zone they
 (4) overgraze and create what scientists call urchin barrens these
 (5) would have been lush but are now so bare of algae that they
 (6) are all urchin barrens in the absence of otters to crawl
 (7) them When that happens the phytoplankton invertebrates that live in
 (8) that habitat and the plant associated fishes decline
 (9) significantly in abundance So there are changes that work
 (10) their way cascading through the ecosystem to different
 (11) components of the system finally affecting these plant
 (12) associated fishes in the near shore zone as well as affecting
 (13) the plant habitat that is an important one for herring egg
 (14) deposition that is the cascade that is the relevance of fish
 (15) in this system There is an additional effect that occurs
 (16) too This is a system where we as ecologists understand as
 (17) posing strong biological interaction that's system where there
 (18) are strong connections between species and when these
 urchin
 (19) barrens develop by removal of the kelps and the seaweeds or
 (20) grazing them down to low numbers it turns out that mussels and
 (21) barnacles among others over here benefit You might say how
 (22) do they benefit That's because they are competing for space
 (23) and so when this space is freed up by having the urchins graze
 (24) off the algae it's taken up by animals which compete with the
 (25) algae So there is a connection from here to here that's not

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(1) illustrated on this diagram because it's not an eating
 (2) connection it's a competition connection but it still falls
 (3) in the category of strong biological interactions which we
 (4) know as coastal scientists are important determinants of the
 (5) way this ecosystem works
 (6) Q Dr Peterson is it your opinion that this ecosystem that
 (7) you've described is susceptible to floating pollutants?
 (8) A Yes it is
 (9) Q How does that work?
 (10) A The floating pollutants affect this system by much the same
 (11) way that I described how it works If we have a floating
 (12) pollutant and let's take for relevance oil spilled in this
 (13) system it floats initially So there is an initial phase
 (14) whereby that oil is in contact with that neuston zone that
 (15) very thin film on top of the ocean surface in which we find
 (16) larvae and eggs of some fishes larvae of a variety of marine
 (17) organisms it also in that case encounters the vertebrates
 (18) they need to breathe and feed the birds and the mammals so
 (19) that's a phase of chronic mortality Then the same ocean waves
 (20) and currents that bring in the food to this shore bring in that
 (21) oil or that nutrient that's floating on the surface and have
 (22) the effect of distributing and applying the pollutant from the
 (23) top of the intertidal zone down to the bottom So that
 (24) pollutant is then laid across on the surface of the intertidal
 (25) zone as well later on as the tide rises and falls the

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- (1) pollutant its oil can be remobilized and float out for some
 (2) long time later as part of that neustonic zone so that can
 (3) live as an effect that curse after the initial acute phase and
 (4) during this later chronic phase when the environment is then
 (5) covered in pollutant or oil
 (6) Q Doctor you may be seated if you wish I want to ask you
 (7) about some of the work you ve done with the trustees
 (8) specifically about the Exxon Valdez oil spill but before I do
 (9) let us just clarify who are the trustees?
 (10) A The trustees are representatives of three federal and three
 (11) state agencies who have responsibility for evaluating the
 (12) impact of the spill on the natural ecosystems and the humans
 (13) that use them They are therefore the secretaries at the
 (14) federal level of the department of commerce the department of
 (15) interior and the department of agriculture or their destinies
 (16) and at the state level the secretary or head of the ADF&G
 (17) Fish & Game the division of natural resources and the
 (18) department of law
 (19) Q All right And calling upon your experience which I think
 (20) you told us was about a month and a half a year for the last
 (21) five years with the trustees is it your opinion that the
 (22) habitats of the coastal ecosystem that you ve described and the
 (23) prey base for herring and salmon was damaged by the Exxon
 (24) Valdez oil spill?
 (25) MR SANDERS Objection getting into this

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- (1) summarization problem
 (2) MR JAMIN I m going to ask him why in a moment I
 (3) think I have a right to ask
 (4) THE COURT That really isn t why the objection is
 (5) being made
 (6) (At side bar off the Record)
 (7) MR SANDERS I withdraw the objection based on the
 (8) statements of counsel
 (9) THE COURT You may proceed
 (10) BY MR JAMIN
 (11) Q Doctor let me repeat the question if I may Calling upon
 (12) again your experience with the trustees science studies and
 (13) with reference to this nearshore system is it your opinion
 (14) that the habitats of the coastal ecosystem and the prey base
 (15) for herring and salmon were damaged by the Exxon Valdez oil
 (16) spill?
 (17) A Yes it is
 (18) Q And what sir is the basis for that opinion?
 (19) A The basis for that opinion comes from several of the
 (20) natural resource damage assessment studies that have been
 (21) conducted and completed by the trustee counsel
 (22) Q Can you describe those studies generally sir?
 (23) A Yes I can One study demonstrated that there was damage
 (24) to fucus Damage means the abundance and biomass of fucus
 (25) declined in the intertidals zone by on average from ten to over

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- (1) 80 percent It declined in all three areas of the spill
 (2) geographically Prince William Sound the Kenai Peninsula and
 (3) Lower Cook Inlet and finally the Kodiak archipelago and the
 (4) Alaska Peninsula The declines did not show recovery by 1992
 (5) the last time there are data for that system and they apply in
 (6) all the different habitats the exposed rocky the sheltered
 (7) rocky the coarse textured boulder cobbled shores and the fine
 (8) textured sand muddy shores In addition additional studies in
 (9) the natural resource damage assessment demonstrated that
 there
 (10) was a decline in the abundance of the stocks and flowering
 (11) stock of the eelgrass of the sea grass and that was in Prince
 (12) William Sound and detected as a 30 percent decline by 1990
 (13) summer of 1990 in the second year second summer after the
 (14) spill
 (15) In addition there was a study of the kelps in all the kelp
 (16) habitats and the kelps also assessed in Prince William Sound
 (17) in year 1990 the second summer after the spill demonstrated
 (18) that in oiled areas there was a significantly lower amount of
 (19) large kelp compared to small kelp indicative of the oil having
 (20) killed the larger kelps in 1989 the year before As well
 (21) there was a study which demonstrated that in those eelgrass
 (22) habitats the abundance of amphipods food for the pink
 salmon
 (23) juveniles the abundance of amphipods declined by 60 percent
 as
 (24) measured in again the summer of 1990 and finally a coastal
 (25) habitat study demonstrated that the abundance of intertidal

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- (1) fishes as a group had declined by 75 percent in the summer of
 (2) 1990 and that the recovery in the biomass was not yet complete
 (3) in 1991
 (4) Q Doctor were the studies that you have just relied on in
 (5) stating your conclusion those that you were directly involved
 (6) in as a peer reviewer and as a person involved in planning and
 (7) designing the science?
 (8) A Yes I was
 (9) MR JAMIN Your Honor I have no further questions
 (10) MR SANDERS I don t think I can finish in two
 (11) minutes
 (12) THE COURT I m disappointed
 (13) MR SANDERS So am I
 (14) THE COURT Ladies and gentlemen we will adjourn for
 (15) the day at this time Please remember my instructions that you
 (16) not listen to or read anything about our case during our
 (17) recess We will reconvene at 8 00 tomorrow morning and we
 will
 (18) be in recess until that time
 (19) (Proceedings recessed at 2 00 p m)

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(1) STATE OF ALASKA)
(2) Reporter s Certificate
(3) DISTRICT OF ALASKA)
(6) I Leonard J DiPaolo a Registered Professional
(7) Reporter and Notary Public
(8) DO HERBY CERTIFY
(9) That the foregoing transcript contains a true and
(10) accurate transcription of my shorthand notes of all requested
(11) matters held in the foregoing captioned case
(12) Further that the transcript was prepared by me
(13) or under my direction
(14) DATED this day
(15) of 1994
(21) LEONARD J DiPAOLO RPR
Notary Public for Alaska
(22) My Commission Expires 2 3 96

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TOTAL OCCURRENCES 14,372
NOISE WORDS 385
TOTAL WORDS IN FILE 40,034

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CASE SENSITIVE

NOISE WORD LIST(S)
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) IN THE UNITED STATES DISTRICT COURT
 21 FOR THE DISTRICT OF ALASKA
 In re) Case No A99 0095 CIV (HRH)
 5)) Anchorage Alaska
 The EXXON VALDEZ) Tuesday June 21 1994
 (6)) 8:00 a m
 TRANSCRIPT OF PROCEEDINGS
 (9) TRIAL BY JURY 30th DAY
 (10) BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE
 VOLUME 26 Pages 4311 4506
 Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 8 00 a m)
 (3) THE CLERK All rise
 (4) (Call to Order of the Court)
 (5) THE COURT Good morning ladies and gentlemen This
 (6) is the continuation of trial in Case A89-0095 Civil
 (7) Mr Sanders
 (8) MR SANDERS Good morning Your Honor
 (9) THE COURT Dr Peterson you understand you re still
 (10) under oath?
 (11) THE WITNESS Yes sir
 (12) THE COURT You may proceed
 (13) MR SANDERS Thank you Your Honor
 (14) CROSS EXAMINATION OF DR CHARLES PETERSON
 (15) BY MR SANDERS
 (16) Q Mr Peterson I want to start with the testimony that you
 (17) gave yesterday concerning the sea urchins As I understand
 (18) what you were telling us was that if there is a significant or
 (19) substantial decline or even extinction of a population like sea
 (20) urchins then that would cause or would result in an increase
 (21) in the number of sea urchins that would be present in the
 (22) Sound and if that should occur that would result in barrens
 (23) or the lack of plant life in the areas because of the increase
 (24) in the number of sea urchins is that roughly it?
 (25) A Yes that s roughly it although my remarks are specific to

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(1) this particular northern Gulf of Alaska ecosystem where this
 (2) phenomenon has been studied and it s specific to the otter
 (3) which is the keystone predator which has the capacity to
 (4) control the abundance of the urchin
 (5) Q And the relevance for us in a case involving fish I assume
 (6) that if you have these barrens then that is another lack of
 (7) habitat for food that fish eat is that correct?
 (8) A That is one of the areas in which that is relevant
 (9) Q So that s how that has to do with this case right?
 (10) A That s one of the ways in which it has to do with this
 (11) case
 (12) Q In your report that you made in October you mentioned that
 (13) there was a sea urchin explosion didn t you?
 (14) A Yes I mentioned that the sea urchins had reappeared in
 (15) western Prince William Sound
 (16) Q Well now isn't it a fact you used the word explosion in
 (17) your report?
 (18) A I would like to see that I may well have if I might
 (19) take a look
 (20) Q I ll be right there in a minute I believe it s on page
 (21) 3 Well let me double check here
 (22) I apologize Your Honor I thought he would remember
 (23) this
 (24) Well I ll ask somebody to check on this and I ll come
 (25) back to this Let me go on with what - I ll find the exact

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- (1) right page in your report
 (2) Whether you called it an explosion or not and I'll
 (3) represent to you that you did and I'll show it to you in a
 (4) minute the basis for whatever it was you said was what
 (5) Dr Peterson?
 (6) A The basis was a discussion with a Mr Stephen Jewett
 (7) Q That was on the telephone wasn't it?
 (8) A Well I didn't finish Mr Stephen Jewett and a Mr Dean
 (9) who were both people who participated in the study of subtidal
 (10) areas where the urchins are found The discussion with Mr
 (11) Jewett was on the phone the discussion with Mr Dean was in
 (12) person at some length
 (13) Q I found it May I approach? If you'll look at the bottom
 (14) of page 5?
 (15) A Yes
 (16) Q You used the word explosion didn't you?
 (17) A Yes
 (18) Q May I have that back?
 (19) A Thank you
 (20) Q Now this what you call an explosion is based on a
 (21) telephone call with Dr Jewett from - he's from the University
 (22) of Alaska?
 (23) A That's correct
 (24) Q And a later conversation with Dr Dean?
 (25) A That's correct

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- (1) Q And both of those gentlemen were and are principal
 (2) investigators with the - in the Trustee study correct?
 (3) A That's correct
 (4) Q And when you talked to Dr Jewett did he tell you where
 (5) these urchins were found?
 (6) A He did not tell me the specific localities of the six that
 (7) he studied My recollection is that he said that urchins were
 (8) abundant at at least four of the six localities where they
 (9) visited
 (10) Q And did Dr Dean tell you where these locations were?
 (11) A If he did I don't recall that information
 (12) Q Did either of these gentlemen tell you how big these
 (13) urchins were?
 (14) A Yes they did
 (15) Q And didn't he in fact tell you that they were of the size
 (16) that sea otters don't usually mess with they are too small?
 (17) A Actually he didn't He said they were small but he said
 (18) the urchins out in Prince William Sound may well have some
 (19) attention by sea otters As a rule otters focus their
 (20) predation on the larger urchins and ignore the small ones but
 (21) they are a preferred prey so it can happen that otters take
 (22) the small ones And in their experience this was a size that
 (23) they had seen otters taking in the past in Prince William
 (24) Sound but there certainly is an issue that these urchins were
 (25) still small at the time

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- (1) Q They needed to grow some before they would be eaten by
 sea
 (2) otters right?
 (3) A No that doesn't follow from what I was saying It's
 (4) likely that the predation rate upon them was not great but
 (5) it's likely that there is some predation rate upon urchins of
 (6) that size
 (7) Q Now since you don't know where these sea urchins were
 (8) found in these six locations four of which were I guess
 (9) relatively abundant you don't know what relation they had to
 (10) where the sea otters had declined as a result of the oil spill
 (11) or whether they hadn't declined right?
 (12) A All of these six locations were in the western part of
 (13) Prince William Sound which is the area that the oil had had an
 (14) impact on the otters The otters live in that area as well as
 (15) the east but they were all in the western part of Prince
 (16) William Sound which is the impact area
 (17) Q But all areas weren't impacted in the western area
 (18) correct?
 (19) A All areas were not impacted and the impact on any given
 (20) species in that system depends upon its mobility and how it
 (21) moves around among those areas So for species that are
 (22) mobile effects are averaged over a large area For species
 (23) that are sessile and stay in one place then effects can be
 (24) more localized Otters fall in a grouping that would be
 (25) considered mobile in that context

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- (1) Q But since you don't know where these locations were
 (2) specifically nor how that relates to where the sea otters were
 (3) or not then it's hard to draw those two facts together is it
 (4) not?
 (5) A Could you clarify what two facts you're referring to?
 (6) Q I'll just move along Dr Jewett - Dr Peterson didn't
 (7) Dr Jewett tell you that a most likely explanation for the
 (8) finding of these sea urchins in these six locations was that he
 (9) had more divers out that year than in previous years?
 (10) A No he definitely did not say that In fact he said just
 (11) the opposite He spent a lot of time in this system over the
 (12) years and had a good feel for the abundance of urchins from a
 (13) time period of the early 70s throughout the Sound in places
 (14) where he had worked up until recent
 (15) Q He didn't call it an explosion did he?
 (16) A I certainly couldn't tell you whether he called it an
 (17) explosion or not
 (18) Q When he talked to you he didn't call it an explosion did
 (19) he?
 (20) A I do not know whether he used that word and he described
 (21) the situation which is what I'm attempting to do
 (22) Q And you describe it as an explosion?
 (23) A Yes I do and I do that because it occurs from a basis of
 (24) effectively zero In fact there was a natural resource
 (25) assessment program to look at urchins in the Sound It was a

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- (1) multi - tens of thousands of dollars research program set up
 (2) by the Trustees and they simply could not find urchins They
 (3) went in the Sound they looked very carefully It wasn't
 (4) random sampling at some sites but it was an attempt to look at
 (5) sea urchins to study and they ultimately had to give the money
 (6) back to the Trustees and say they couldn't do it because there
 (7) were no urchins there
 (8) Q And in years prior to that there were urchins though
 (9) weren't there? And isn't that the natural cycle they spike
 (10) up heavy recruitment they go down and spike up and then they
 (11) go down?
 (12) A There were urchins relatively consistently in the early
 (13) 70s The decline in urchins coincided with the otters
 (14) increase in the system but I would agree with you that urchins
 (15) have sporadic recruitment success as a rule that there is some
 (16) variability from year to year in the numbers of young urchins
 (17) that settle out.
 (18) Q Now you mentioned when you were testifying yesterday that
 (19) around the turn of the century sea otters were virtually
 (20) extinct and that things had to be done to make sure that the
 (21) entire population from this area wasn't just completely wiped
 (22) out isn't that right?
 (23) A Yes I would say that the effects of hunting for the pelts
 (24) had reduced the range of sea otters so that you could call them
 (25) locally extinct through northern California and other portions

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- (1) of the coastline including a large fraction including the
 (2) northern Gulf of Alaska The population it wasn't entirely
 (3) extinct because otters still remain and that's how they
 (4) recovered
 (5) Q And the level or population of otters in this region
 (6) Prince William Sound Alaska coast in the turn of the century
 (7) was certainly less than it is now wasn't it?
 (8) A Yes that's true
 (9) Q And in those years those early years when there had to be
 (10) some protection for them was there evidence of lots of
 (11) barrens?
 (12) A We don't have data from 1901 or 1902 to be able to address
 (13) that or at least no data that I have been acquainted with
 (14) Q Any evidence - well when did the sea otters start coming
 (15) back?
 (16) A The population began recovering soon after the hunting
 (17) pressure was released They have the potential to increase at
 (18) three or four percent a year and begin that increase as soon
 (19) as the hunting pressure stops removing excess otters if you
 (20) will
 (21) Q When did they come back in sufficient numbers to control
 (22) these exploding sea urchins?
 (23) A Well in the range of somewhere between the mid 70s and
 (24) probably 1985 I think is my understanding of the time frame
 (25) in which urchins effectively disappeared from the Sound and the

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- (1) otters were growing rapidly in that time
 (2) Q And during the years prior to the 70s was there a great
 (3) shortage of salmon and herring as a result of these barrens
 (4) caused by the explosion of these sea urchins?
 (5) A The salmon landings have increased since those times until
 (6) just very recently but there was certainly not an absence of
 (7) salmon or herring that was associated with that time period
 (8) Q And I guess in the time period of the 70s and the 60s and
 (9) the 50s there is likewise no evidence of great barrens?
 (10) A Again I do not know of any evidence that addresses the
 (11) full extent of that vegetated nursery habitat in that time
 (12) period The evidence that began to become collected was that
 (13) I'm aware of extensive later than that
 (14) Q So you don't know if the theory that you told us about
 (15) yesterday worked in the 40s and the 50s and the '60s in
 (16) Prince William Sound with respect to sea urchins otters and
 (17) barrens do you?
 (18) A Let me answer that by saying that we know that this worked
 (19) in earlier times in the northern Gulf of Alaska by virtue of an
 (20) ability to dig up Indian that is to say - let me rephrase
 (21) that. Alutiq kitchen middens which are deposits of materials
 (22) that had been eaten by those peoples and go back some time
 (23) in
 (24) doing that - and that is Aleutian area
 (25) In doing that it was quite clear that the relationship
 (26) that I talked about between otters urchins and fish held over

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- (1) a long period of history going back over a thousand years
 (2) That particular study was not conducted in Prince William
 (3) Sound but the system is sufficiently similar that there is
 (4) every reason to believe that those results would hold there as
 (5) well
 (6) Q But Doctor my question to you is if those results would
 (7) hold then you would expect to see some dramatic change in
 (8) the
 (9) salmon population in Prince William Sound in the years when
 (10) you
 (11) had the shortage of otters as a result of these barrens and
 (12) you don't have that sort of information increases In fact
 (13) the information is to the contrary isn't it?
 (14) A I have not done an analysis to look at that information
 (15) and I cannot say it is to the contrary
 (16) Q You just don't know then?
 (17) A I have not looked historically to make that relationship
 (18) no
 (19) Q So you don't know whether this theory from this study that
 (20) you're referring to actually works?
 (21) A I believe that -
 (22) Q It works in the Aleutians it worked in that study but you
 (23) don't know whether it works with respect to history in the 40s
 (24) and the 50s or the 60s or now?
 (25) A Science works by not repeating every test of every question
 (26) in every place you go and an understanding of the processes
 (27) and how the system works that might be developed in one
 (28) place

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- (1) is well transportable to others unless there are fundamental
 (2) reasons to make that system different I don't have any reason
 (3) to believe that the Prince William Sound system is different in
 (4) a significant environmental way to make those interactions any
 (5) different
 (6) Q As a hypothesis you can defend it but whether it actually
 (7) applies here and now to this situation you don't know?
 (8) A I can defend it as well and I do it on the grounds that I
 (9) just argued and that is that science works by creating an
 (10) understanding of the system the way things interact one with
 (11) another and while we may not have done that experiment in
 (12) every place we wish to have that understanding the
 (13) understanding allows us to draw reasonable and confident
 (14) conclusions
 (15) Q When did Dr Jewett report this to you September of 93
 (16) wasn't it?
 (17) A Sometime after the summer of 1993 September I believe
 (18) Q And have you done experiments to determine whether this
 (19) phenomenon does work since then since getting this
 (20) information?
 (21) A No What I have done is to ensure that the Trustees are
 (22) aware of this phenomenon and that they would fund a
 continuing
 (23) project by Mr Jewett to go out and follow the consequences of
 (24) this and that is what I've done in the meantime In other
 (25) words I -

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- (1) Q In other words you want to see if it's going to work?
 (2) A In other words I want to see how much of it is going to
 (3) happen In other words the extent of this is an issue that is
 (4) a reasonable issue One can use science to reach reasonable
 (5) and well established confident conclusions about process
 about
 (6) factors making substantial contributions to other species
 (7) populations but the actual magnitude in estimating those
 (8) actual magnitudes is something that's not as easy to do and
 (9) that is an important issue an important enough one to justify
 (10) wanting to go out in the Sound in this system so that the
 (11) magnitude of any effect like this could be ascertained and
 (12) that's the motivation I think for wanting to continue this
 (13) Q Let me turn to what you said at the end of yesterday You
 (14) gave an opinion that - and I'm through with sea urchins
 (15) You gave an opinion that the habitat in Prince William
 (16) Sound and the habitat is the one you described at some length
 (17) yesterday was damaged by the oil spill and then you said -
 (18) and I want to make sure that I've got this right - you said
 (19) that you based that opinion on at least three or four studies
 (20) four studies and then I think a corollary or an added part to
 (21) one of those studies and one of those was that there had been
 (22) damage with respect to the abundance and biomass of fucus
 and
 (23) that decline had been between 10 and 80 percent correct?
 (24) A I qualified that and said much more If there were a
 (25) court reporter record I could repeat it but I could attempt

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- (1) to do it right now
 (2) Q I'll just read it to you
 (3) A If you'd like me to qualify with additional comments I
 (4) Q I'm on the page 4304
 (5) Can you describe those studies generally sir?
 (6) Answer Yes I can One study demonstrated that there was
 (7) damage to fucus Damage means the abundance and biomass
 of
 (8) fucus declined in the intertidal zone by on average of 10 to
 (9) over 80 percent It declined in all three areas of the spill
 (10) geographically Prince William Sound the Kenai Peninsula and
 (11) Lower Cook Inlet and finally the Kodiak archipelago and the
 (12) Alaska Peninsula The declines did not show recovery by 1992
 (13) the last time there was data for that system and they apply in
 (14) all the different habitats the exposed rocky the sheltered
 (15) rocky the coarse textured boulder cobbled and the fine
 (16) textured sand muddy shores
 (17) A Yes that is the way in which I clarified that
 (18) Q You call that a clarification?
 (19) A Well that -
 (20) Q That's a description of how wide the range was right?
 (21) A The point is that the coverage of where those - where that
 (22) information was drawn from
 (23) Q Then you said in addition there were studies showing a
 (24) decline in the abundance of the stalks and flowering stalks of
 (25) eelgrass of the sea grass and that was in Prince William

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- (1) Sound and detected as 30 percent decline by 1990 summer of
 (2) 1990 in the second year second summer after the spill
 (3) correct?
 (4) A Yes
 (5) Q Then you said that there had been a significantly - there
 (6) were studies showing a significantly lowering amount of large
 (7) kelp as opposed to small kelp indicative of having killed the
 (8) larger kelps in 1989 the year before and that was a 1990
 (9) study?
 (10) A That's correct
 (11) Q And then you said that there was a study showing that there
 (12) had been a decline in amphipods?
 (13) A Yes
 (14) Q And that was in 1990 correct?
 (15) A Yes That was the 1990 information that I referred to
 (16) Q And that decline was how much?
 (17) A The decline in amphipods was in the ballpark of 60 percent
 (18) in the eelgrass habitats and the lower fringe of the eelgrass
 (19) habitats
 (20) Q And my copy of the transcript gets hard for me to read for
 (21) some reason The last study had to do with intertidal fishes
 (22) and my recollection is that you said that there was a 75
 (23) percent decline of intertidal fishes in 1990?
 (24) A My recollection was 70 but 75 is in the same ballpark
 (25) That's the ballpark of the decline in abundance of intertidal

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- (1) fishes observed in 1990
 (2) **Q** And you said there was no recovery of that in 91?
 (3) **A** No I said it had not yet recovered by 91 There was a
 (4) progress towards recovery but the biomass difference on
 (5) average remained in 1991 - in other words both the numbers of
 (6) fish were counted and also they were weighed So there was a
 (7) measure of how much there was in terms of biomass
 (8) **Q** Now the habitat you ve explained yesterday is where the
 (9) food - where the food for some of the fishes including salmon
 (10) and herring larvae and juveniles live and are sheltered and
 (11) grow right?
 (12) **A** Yes
 (13) **Q** That s what we re talking about food for fish?
 (14) **A** Yes
 (15) **Q** And you re talking about a habitat effect based on these
 (16) studies or demonstrated maybe by these studies that you
 (17) referred to in 1990?
 (18) **A** Yes in other words I ve spoken to the plant which forms
 (19) the structural basis of the habitat and acts in so many ways
 (20) that I discussed as the bed for laying of herring eggs as the
 (21) habitat for numerous organisms that especially pink salmon eat
 (22) during their two month stage in their life cycle when they
 (23) emerge from the streams and I ve spoken about amphipods
 (24) which
 (25) form one of the prey items for pink salmon during that two
 (26) month period after they have emerged from streams And

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- (1) similarly I ve spoken of the intertidal fishes which include
 (2) prey for adult salmon as they return back into the Sound as
 (3) well represent a group that is living in that environment So
 (4) one can use that as an indication of how the environment is
 (5) functioning to grow those fishes and produce those fishes that
 (6) are sharing that habitat
 (7) **Q** Now I m glad you mentioned pink salmon They are part of
 (8) this food web that you ve described for us here You of
 (9) course recognize they have a two year life cycle?
 (10) **A** Yes
 (11) **Q** And the salmon that were growing feeding in the Prince
 (12) William Sound and these other affected areas when the oil was
 (13) there in the spring and the summer and the fall of 1989 are the
 (14) group that returned to spawn in 1990 right?
 (15) **A** The juveniles that had emerged in 1989 are the ones that
 (16) return as adults in 1990
 (17) **Q** And they are the ones that eat this food that you re
 (18) talking about?
 (19) **A** They are the ones that ate it in 1989
 (20) **Q** Right they ate it when the oil was there right
 (21) presumably if they could?
 (22) **A** One presumes yes
 (23) **Q** Right And it s that class that year of fish that would
 (24) return if they lived and survived in 1990 where they would
 (25) come in and they would spawn and then they would die or they

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- (1) would be caught by fishermen right?
 (2) **A** Yes You re going through the first year of life history
 (3) of the salmon that were exposed as juveniles when they
 (4) emerged
 (5) from the streams or alternatively from the hatcheries that s
 (6) the first year of history
 (7) **Q** Right And isn t it a fact that the 1990 - well let me
 (8) take one other step here with you These ones that are
 (9) returning to spawn in 1990 those are the ones that constitute
 (10) the run size they measure for the fishermen right, the ones
 (11) coming back to spawn that are the ones that the fishermen
 (12) catch?
 (13) **A** Yes That s the way we define the run strength or run size
 (14) is how many have returned to spawn or alternatively to be
 (15) intercepted by the fishery before they spawn
 (16) **Q** And then in 1990 these fish that had fed and swum out of
 (17) the Sound when the oil was there was the largest record catch
 (18) in history right?
 (19) **A** That is my understanding
 (20) **Q** Then the fish the pink salmon that fed as larvae and
 (21) juveniles in 1990 the time you had these studies here when
 (22) they fed and then left They returned in 1991 correct to be
 (23) caught or to spawn and die?
 (24) **A** The ones that emerged in 1990 are the ones that returned as
 (25) adults in 1991
 (26) **Q** And that was the second record - second highest year in

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- (1) history?
 (2) **A** That may be but what you are not knowing how many fish -
 (3) **Q** Just say yes or no
 (4) **MR JAMIN** Your Honor may the witness answer the
 (5) question?
 (6) **THE COURT** The witness tends to extend his answer
 (7) You re entitled to yes or no and you re entitled to get a yes
 (8) or no on that answer
 (9) **THE WITNESS** May I have the question repeated?
 (10) **BY MR SANDERS**
 (11) **Q** Isn t it a fact that the run size of pink salmon in Prince
 (12) William Sound in 1991 was the second highest in history?
 (13) **A** That s my understanding
 (14) **Q** The salmon let s talk about that in relation to the
 (15) habitat you were describing
 (16) Do you know in 1989 and 1990 what percentage of the salmon
 (17) pink salmon came from hatcheries as opposed to wild stock?
 (18) **A** Not exactly but it s in the ballpark of 75 percent
 (19) **Q** So by far a substantial majority of the salmon that
 (20) constitute the run the fish catch come from hatcheries
 (21) right?
 (22) **A** Yes that s true
 (23) **Q** And the other 25 percent or whatever that less than 50
 (24) percent number is come from the wild pink salmon that go up
 (25) these freshwater streams to spawn and they live in those

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- (1) freshwater streams after spawning excuse me and the eggs
 (2) then after spawning the eggs develop grow they live in
 (3) those freshwater streams and come out and feed and they have
 (4) the two year life cycle that's the wild stock right?
 (5) A Yes
 (6) Q Now how many pink salmon hatcheries were in the areas
 (7) affected - well let me strike it and ask it a clearer way for
 (8) you
 (9) How many pink salmon fish hatcheries were there?
 (10) A There are four I believe
 (11) Q How many of those were in areas where the oil came?
 (12) A Well that depends on how you define that because there
 (13) are fish that move out of that region so the fish go through
 (14) regions where the oil has been independent of the source
 (15) Q Doctor the question is how many hatcheries were in areas
 (16) where there was an - where the oil was spilled where the oil
 (17) came right one out of four?
 (18) A I guess what you're meaning is how many hatcheries are
 (19) ones
 (20) where the shorelines adjacent to them were oiled?
 (21) Q Exactly
 (22) A And one is my understanding
 (23) Q And are you aware that that one was boomed so that oil
 (24) didn't get into the hatchery? As a matter of fact they were
 (25) all boomed but only one of them was boomed where there was
 oil right?

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- (1) A I knew there was booming I don't know anything about the
 (2) success of it really
 (3) Q And let's talk about the wild stock Of the wild stock
 (4) what percent of the pink salmon wild stock returned to streams
 (5) in areas affected by the oil?
 (6) A About 50 percent is my understanding of the streams
 (7) streams that were oiled versus unoled
 (8) Q 50 percent?
 (9) A I believe so I could have that wrong
 (10) Q You could be about 30 percent off couldn't you? 20
 (11) percent sound better 15?
 (12) A To be honest I don't know You asked a question on which
 (13) I don't have a specific answer My recollection is it was
 (14) about half
 (15) Q Well if you don't know tell us you don't know
 (16) A I don't know the specific number I know it was a
 (17) substantial number
 (18) Q Substantial What do you mean by substantial? If you
 (19) know just tell us Doctor you don't know That will help us
 (20) if you tell us when you don't know Do you know?
 (21) A I answered I don't know the specific number I know that
 (22) it's a substantial number
 (23) Q Now relating your testimony about the habitat to these
 (24) numbers that we've been talking about the salmon generally
 (25) because of these - this mystery of science not only come back

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- (1) to spawn to the place where they were born they also tend to
 (2) feed close to as juveniles and fry They feed close to where
 (3) they were born before they leave right?
 (4) A There is some period of time during which they remain in
 (5) the near shore Exactly how far they move we hope to
 (6) understand but basically that's an accurate description
 (7) Q Now there was a study was there not by the Trustees by
 (8) principal investigators about the zooplankton levels in the
 (9) Sound in 1989 and 1990 correct?
 (10) A There was indeed a study that combined the zooplankton
 (11) sampling with an examination of the pink salmon in the
 (12) near shore
 (13) Q And that was done by a Mr or Dr Wortheimer (ph)?
 (14) A That's correct
 (15) Q What did that study show?
 (16) A That study showed that the pink salmon coming from the
 (17) hatchery where there was an oiled shoreline grew substantially
 (18) less than the pink salmon that came from hatchery where the
 (19) shoreline was unoled It also had zooplankton sampling where
 (20) they were unable to detect a difference in the abundance of
 (21) zooplankton in the shorelines of the oiled and unoled sites
 (22) Q Dr Peterson it's the last part I want to ask you about
 (23) Zooplankton were in your food web there right?
 (24) A That's correct
 (25) Q That's food for pink salmon?

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- (1) A That's correct
 (2) Q Juvenile fry larvae?
 (3) A It's one of their foods and a principal one
 (4) Q And that study in 1989 and 1990 showed that there was no
 (5) reduction in the zooplankton level in the areas studied
 (6) correct? Food didn't change?
 (7) A I have to qualify that Zooplankton are very mobile
 (8) organisms They are transported by the water masses that they
 (9) are in That's partly why they are called plankton and so it
 (10) is very difficult to detect effects on a small scale of any
 (11) kind of large change in their abundance even if that change
 (12) occurred And what that means is if there were one it could
 (13) be averaged over a fairly large area
 (14) So the zooplankton sampling that was conducted as part of
 (15) that study is simply not adequate sorts of sampling to address
 (16) the hypothesis that there may have been an effect of oil on
 (17) zooplankton over a large area So the data in that simply
 (18) can't be used to test the notion if you had it and indeed many
 (19) did that zooplankton may have suffered from the oiling effect
 (20) Q Stated another way those studies in 89 and 90 certainly
 (21) didn't support the proposition that there had been a reduction
 (22) in that type of food for salmon and herring in the spill areas?
 (23) A Those studies demonstrated more to the point that the
 (24) salmon grew less in the shoreline that was oiled than they did
 (25) in the shoreline that wasn't oiled and the growth of pink

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- (1) salmon during that stage of their life history relates directly
 (2) to the probability that they will return as adults to the
 (3) fishery if they don't grow large during that period the
 (4) probability is low that they will return as adults because of
 (5) predation that affects them during their life history
 (6) It does not say that the source of that difference was
 (7) zooplankton However it says more importantly that there
 (8) was an impact of the oiling on the growth rates of the fish
 (9) which is directly related to their probability of return
 (10) Q Dr Peterson we've already talked about that The ones
 (11) that were going out in '89 are the ones that came in in 1990
 (12) and set a record and the ones that were going out in '90 came
 (13) back in 1991 and was the second highest catch in history isn't
 (14) that a fact?
 (15) A Yes
 (16) Q All right Let's go to these other reports that you
 (17) mentioned
 (18) Can I have the bar code please?
 (19) Now make sure that I have - Your Honor I have neglected
 (20) I think to take one exhibit up I have the stack up there
 (21) but I left out one may I approach?
 (22) Doctor I want to make sure that you and I are talking
 (23) about the same reports here and I want to make sure the jury
 (24) understands which report you're talking about When you
 talked
 (25) about the eelgrass you were basing that on a report that

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- (1) appears in the Exxon Valdez Oil Spill Symposium at page 94
 and
 (2) it was an article done by Dean and I may mispronounce this
 (3) Stekolil and Steve Jewett?
 (4) A Is that a question?
 (5) Q Yes that's a question
 (6) A That is a summary of the information that's presented in
 (7) that abstract but there is a broader report on the subtitle
 (8) Habitat that's several pages long that I have shared with you
 (9) and that includes much more detail It's summarized here in
 (10) the abstracts
 (11) Q But that's the same report You've got a longer more
 (12) wordy version of it but this is an abstract of it?
 (13) A Yes I think they are in agreement but elaborated further
 (14) in the longer more wordy version
 (15) Q And then the next one about the amphipods that appears in
 (16) a report done by Jewett and Dean starting at page 97 We're
 (17) talking about the same report there that's where you got the
 (18) information you gave us yesterday about the amphipods?
 (19) A Again that information is drawn from the actual larger
 (20) source and it's described also as a summary here
 (21) Q Okay
 (22) A I haven't confirmed that those were the proper summaries
 (23) but I'll take it that they are
 (24) Q I'm looking for my glasses This next one is so small I
 (25) can't read it

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- (1) I'm confused about where - well I'm not confused but I'm
 (2) not sure where you got this 70 percent or 75 percent
 (3) intertidal fish business Can you tell us?
 (4) A Yes I'd be happy to That too comes from the Purlin
 (5) report in this case from the intertidal program the so-called
 (6) longer wordy version and that was reported both in their
 (7) annual report in 1992 and a more recent one of 1993 that I've
 (8) shared with counsel
 (9) Q I've handed Defendants Exhibit 9252 That's that smaller
 (10) one I just brought up Is that where this intertidal fish
 (11) business comes from have I guessed that right or the people
 (12) that were helping me guessed that right? Is that the right
 (13) one?
 (14) A This is a very incomplete and preliminary study of the
 (15) information which in later reports is provided in more detail
 (16) and more fully described But this is an attempt to make what
 (17) was the earliest looks like 1991 description of that in the
 (18) preliminary report. Subsequently there were final reports
 (19) produced in 1992 and - well another - preliminary one in '92
 (20) but a final report in and around December of 1993, that present
 (21) this information in the detail that that is available
 (22) Q But at least I'm in the right ballpark here? This is the
 (23) report? It may not be the longer version of it but it is -
 (24) we're on the right page of the song book right?
 (25) A We're on the wrong song book

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- (1) Q We are? Is it the right report or the wrong report?
 (2) A This is the wrong report for the detailed information
 (3) It's a preliminary report referring to their initial
 (4) presentation of some of that information The final report has
 (5) the full set and the full set of analyses of this data rather
 (6) than summary statements
 (7) Q Well put that one aside then Let's talk about the
 (8) amphipods
 (9) Can I have - excuse me just a minute Your Honor
 (10) Is this the title of the report?
 (11) A Yes of the abstract in the Exxon Valdez Oil Spill
 (12) Symposium Abstract Volume
 (13) Q Ask you to turn to the next page?
 (14) A What is this page if I might ask?
 (15) Q This is page 97 first page of that abstract Did you find
 (16) it?
 (17) A I'm sorry Looking to the yellow marks?
 (18) Q First I wanted to know have you found the abstract at page
 (19) 97?
 (20) A Yes I'm on 97
 (21) Q That is the abstract we were talking about earlier?
 (22) A Yes
 (23) Q Now would you turn to the second page please or you can
 (24) look up on the screen? First you said that in 1990 the
 (25) amphipods had been reduced by 60 percent right?

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- (1) A That s correct
 (2) Q Would you read for the jury - let me see if I can bring this up a little bit Can you read for the jury the first section that is highlighted in yellow?
 (3) A Perhaps the greatest single indication of initial oil effects followed by recovery was the recolonization of oiled sites by sensitive burrowing amphipods In 1990 at 6 to 20 meter depths the abundance of all amphipods was significantly greater at unoiled (unoiled mean equals 47 individuals/ 0/1 meter squared
 (4) Q Stop right there That s what you told us yesterday?
 (5) A That s the information on which I based my comment yesterday
 (6) Q Would you read the next sentence that you didn t tell us yesterday?
 (7) A However at this depth in 1991 no difference in total amphipod abundance or biomass was detected between oiled and unoiled sites
 (8) Q Let me take you down to the last highlighted portion could you read that for us?
 (9) A Yes I d be happy to Within Prince William Sound these crustaceans had reoccupied the oiled sites in significant densities by 1991 just two years since being oiled
 (10) Q These crustaceans were the amphipods?
 (11) A Yes that s correct

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- (1) Q Let me ask you to back up - first before I do that take this off for a second
 (2) You mentioned the fucus and I ll refer you back to that report Do you recall reporting on the fucus toward the end of your October report and saying that there hadn t been a complete recovery of the fucus?
 (3) A Yes I don t recall the exact words but that is my understanding and that s what the data indicate
 (4) Q If the Court will permit me I ve got a marked up tabbed copy of your report I want to make sure we re talking about the same thing Here have I found the right place?
 (5) A Yes and this is the most recent report where I mentioned fucus
 (6) Q Let s talk about what you mean by not complete recovery of fucus
 (7) A What I mean is -
 (8) Q Let me ask you the question
 (9) A I thought that was a question sorry
 (10) Q Now Your basis for saying that fucus had not been completely recovered is information from I think a Houghton and Lees report that said that on certain south facing beaches that a half a meter had still not grown back in the intertidal zone correct?
 (11) A That s partially correct The Houghton and Lees was the one that did talk about the south and north facing area There

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- (1) was additionally a study done by the Chia group (ph) which includes Highsmith and Stekolli that are following fucus recovery as well
 (2) Q Well I m talking about this Houghton and Lees report and your reference to it in your report of October of 1993?
 (3) A Yes I m trying to say that there are additional sources of information on that
 (4) Q Well but let s stick to what we ve got here We ve got here that fucus on south facing shores haven t grown back to prespill levels and the amount of that is a half a meter correct?
 (5) A I don t quite understand If you could clarify what you mean by -
 (6) Q Well let s make sure -
 (7) A - half a meter as an amount?
 (8) Q This intertidal zone that you explained to the jury yesterday is a - do you want some more water?
 (9) A Dry pants might be better but no I m fine
 (10) Q Speaking of water this intertidal zone that you described yesterday is a zone between the high tide and the low tide right?
 (11) A That s correct
 (12) Q And in Prince William Sound and other areas contiguous to it some of the highest tides in the world exist right?
 (13) A Yes

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- (1) Q So that intertidal zone is relatively huge compared to other places in the world?
 (2) A Yes it s a good size
 (3) Q And depending on what your shoreline surface is that can be a huge area?
 (4) A Indeed if the slope is gradual you can have a large area
 (5) Q And so there could be if it s - like if you got a shoreline that goes at a 45 degree slant back you ve got one area of coverage If it goes back gradually for a long way you ve got a totally different area of coverage and if you ve got a sheer cliff you have got still another amount of coverage?
 (6) A Right
 (7) Q And fucus grow from the I assume from at or near the low tide level up to close to the high tide level?
 (8) A Yes that s right The fucus plant occurs throughout that zone to almost the highest levels
 (9) Q And at the highest levels of course that s the part that has the least moisture the most amount of the time?
 (10) A That s correct
 (11) Q That s the drier part of the habitat?
 (12) A Right that s the part where desiccation can be most significant for both the plant and the animals that are sheltered by the plant

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- (1) Q And that is the area where there are probably relatively
 (2) fewer microorganisms less food less critters than at lower
 (3) down where there is more moisture right?
 (4) A That depends on the beach but as a rule the abundances
 (5) would be less higher on shore than lower on shore
 (6) Q To use Mr O Neill's word makes sense doesn't it?
 (7) A Once we understand how the system works I think so
 (8) Q Now what you're saying in this report is of this stretch
 (9) depending on whatever area we're talking about here that lack
 (10) of recovery was shown by the fact that the fucus were a half a
 (11) meter below prespill levels on the south facing shores right?
 (12) A Yes I would have to refer - review the time frame but
 (13) that was I believe in 1993
 (14) Q That's the date of your report?
 (15) A No I understand it's the date of the report but what I'm
 (16) trying to point out is some of these studies ended in 1990
 (17) 1991 at various time frames and that represents the last
 (18) information that I or others had available and I was trying to
 (19) refresh my memory of whether this was 1992 or 1993
 (20) information
 (21) that - on which this comment was made 1992 is the answer
 (22) Q And you're saying that in this report that as of whatever
 (23) the date of this study was or the date of your report there
 (24) is still not complete recovery of the fucus because you say
 (25) that on south facing beaches it's a half a meter below in this
 (26) higher zone prespill levels correct?

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- (1) A Yes that was the remaining damage that was illustrated by
 (2) 1992
 (3) Q I have one final thing to ask you about Doctor You told
 (4) us yesterday that density of eelgrass in 1990 was 30 percent
 (5) below levels and that's your example of habitat damage right
 (6) an example of habitat damage?
 (7) A That's correct That was one of the three plant habitats
 (8) that suffered damage and that information was 1990
 (9) Q Can I have page 94 please? Would you please turn to page
 (10) 94? Is this the report or an abstract of the report on which
 (11) you based that statement yesterday?
 (12) A Yes it is
 (13) Q Would you read the first sentence please of the
 (14) highlighted portion on the screen?
 (15) A Sure The density of eelgrass tunons was approximately 30
 (16) percent greater at control sites than at oiled sites in 1990
 (17) (P = 0.08) and there were significantly fewer flowered plants
 (18) at oil sites (P = 0.08)
 (19) Q Stop there just a minute These comparisons that we're
 (20) talking about both with the amphipods and the fucus and the
 (21) eelgrass is where these scientists went out these principal
 (22) investigators went out and they made studies and they
 (23) compared
 (24) various things at what they called control sites versus oil
 (25) sites correct?
 (26) A Yes that's exactly the design

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- (1) Q And the control sites were sites where there was no oil and
 (2) had been no oil as a result of the Exxon Valdez oil spill
 (3) correct?
 (4) A Not fully correct In that design the control sites
 (5) included some slightly oiled sites The design was one that
 (6) included heavily oiled and moderately oiled sites for the
 (7) so-called oiled sites and for the unoled sites there were
 (8) lightly oiled as well as unoled as well referring to the
 (9) initial oiling not to any subsequent reintroduction that might
 (10) have occurred on sediment particles or sheens later on but so
 (11) long as we understand that was the basis on which they were
 (12) established
 (13) Q Well whatever that qualification you put on it was it
 (14) didn't keep you - them from saying and you from saying to this
 (15) jury yesterday that the oil had caused a 30 percent reduction
 (16) in eelgrass in 1990?
 (17) A Yes that is what was exhibited in 1990 I didn't comment
 (18) on what the reduction may have been earlier because the data
 (19) were not there
 (20) Q And you didn't comment on what it was the next year did
 (21) you?
 (22) A No sir I did not continue to talk about all the bulk of
 (23) additional information or to talk about the time frames on
 (24) recovery for the various components
 (25) Q Well for my last request to you Doctor would you do that

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- (1) now read the second sentence?
 (2) A By 1991 eelgrass had apparently recovered as there were no
 (3) differences noted among sites with respect to either tunon
 (4) density (P = 0.52) or flower density (P = 0.62)
 (5) MR SANDERS I have no further questions Your
 (6) Honor
 (7) REDIRECT EXAMINATION OF DR CHARLES PETERSON
 (8) BY MR JAMIN
 (9) Q Dr Peterson Mr Sanders asked you some questions just
 (10) most recently about damage which occurred through 1990 or
 (11) through 1991 or through 1992 or through 1993, and then was
 (12) getting better or perhaps even had recovered With reference
 (13) to the life cycle of pink salmon and herring in Prince William
 (14) Sound and the other areas of the oil spill are effects of that
 (15) duration from a year to four years significant?
 (16) A Yes they are tremendously significant
 (17) Q Why is that sir?
 (18) A Well let me answer with the two species separately When
 (19) we see for example a 30 percent decline in eelgrass habitat
 (20) as measured in 1990 it is highly likely that there was a
 (21) decline of that same magnitude or greater in 1989 when the oil
 (22) actually struck but when there was no field program to
 (23) measure
 (24) it
 (25) Assuming the case then by taking 1989 and 1990 you hit
 (26) both the even year class and the odd year class of pink salmon

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- (1) and pink salmon only live two years so you get the entire life
 (2) cycle You get the species that are the even year one year
 (3) that are affected The even [sic] year the next year and the
 (4) abundances that affect the one generation will affect the
 (5) abundances in the next
 (6) For the herring the herring live a long time and
 (7) typically herring have a big year class every say four years
 (8) and that year class lives as much as nine years and on it feed
 (9) numerous other fishes including pink salmon So when you
 have
 (10) a multi year effect affecting habitat of herring and that
 (11) affects the abundance of herring subsequently then those
 (12) effects extend over all the years that the herring now dead
 (13) should have been there and should have helped feed pink
 salmon
 (14) and other fish in the ecosystem So there was a memory in the
 (15) form of missing fish that occurs from events that happened
 (16) those two years to the habitat
 (17) Q Just one other area Doctor Mr Sanders asked you to
 (18) affirm that the 1990 pink run had been the highest in history
 (19) and the 1991 pink run had been the second highest in history
 (20) and you did that
 (21) Do you have an opinion as to whether the 1990 or 1991
 (22) salmon runs would have been different but for the spill?
 (23) MR SANDERS Objection Your Honor I think this is
 (24) beyond his area of qualifications I asked him these questions
 (25) as a matter of fact if he knew them I don't think he s

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- (1) qualified to testify as to what these runs mean
 (2) THE COURT I have some doubts about that question
 (3) given the background that I heard and the qualifications that I
 (4) heard I'll sustain the objection
 (5) BY MR JAMIN
 (6) Q With respect to the habitat sir do the effects to the
 (7) habitat that you've described in 1989 have carry over effects
 (8) for pink salmon beyond 1989?
 (9) MR SANDERS Same objection Your Honor
 (10) MR JAMIN This is a habitat question
 (11) MR SANDERS No it's an effect question
 (12) THE COURT Give me a second I'll allow that one
 (13) MR JAMIN You can answer
 (14) THE WITNESS Could I have the question repeated?
 (15) MR JAMIN I'll ask the reporter to read it back
 (16) (The question was read by the court reporter)
 (17) THE WITNESS Yes they do I mentioned earlier how
 (18) the -
 (19) MR SANDERS Object It was a yes or no question
 (20) and since we're kind of on the border here Your Honor let me
 (21) ask that Counsel ask the next question so we can tell where
 (22) we're going to go next
 (23) THE COURT Go ahead ask the next question
 (24) BY MR JAMIN
 (25) Q Explain the reason for your response sir

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- (1) A The reason for my response is that the salmon live two
 (2) years and as a consequence of that habitat effect they have
 (3) been affected in one year and their abundance will be delayed
 (4) in the next The number of eggs they produce will be reduced
 (5) because the fish are reduced and to the degree that the pink
 (6) salmon eat herring the herring effect has occurred and is
 (7) continuing by lower abundances of herring lower than would
 (8) have been the case in the absence of the damage to their
 (9) rearing habitat and their spawning habitat so that these
 (10) effects have a memory through the ecosystem and a memory
 that
 (11) interaction through other species and elements through the
 (12) ecosystem beyond the pink salmon and the herring but have the
 the
 (13) ability to come back and effect pink salmon and herring through
 (14) indirect effects in the ecosystem
 (15) These indirect effects can be slow in showing up and
 (16) delayed but they are potentially real
 (17) MR JAMIN Dr Peterson thank you very much Your
 (18) Honor thank you
 (19) THE COURT You may step down sir Call your next
 (20) witness
 (21) MR JAMIN Your Honor plaintiffs call James Bush to
 (22) the stand
 (23) MR NEAL Your Honor we might shorten things with
 (24) the benefit of a side bar at this point
 (25) (At side bar off the record)

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- (1) THE CLERK Stand and raise your right hand sir
 (2) (The Witness Is Sworn)
 (3) THE CLERK Please be seated For the record state
 (4) sir state your full name your address and spell your last
 (5) name
 (6) THE WITNESS My full name is James Gilbert Bush
 (7) B u s h I live at 3915 Ironton Drive West Richland
 (8) Washington
 (9) MR JAMIN Your Honor one technical matter I'd like
 (10) to clarify before the beginning of Mr Bush's testimony and
 (11) that is plaintiffs with withdraw 3754 which was offered
 (12) yesterday
 (13) THE COURT I understand there is no disagreement to
 (14) that?
 (15) MR NEAL That's right
 (16) THE COURT Plaintiffs 3754 is withdrawn at this
 (17) time
 (18) (Exhibit PX3754 withdrawn)
 (19) MR JAMIN Thank you
 (20) DIRECT EXAMINATION OF JAMES G BUSH
 (21) BY MR JAMIN
 (22) Q Mr Bush how are you currently employed?
 (23) A I'm a senior scientist and a geologist for ICF Kaiser
 (24) Engineers and a project manager
 (25) Q How long have you been employed in that position?

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- (1) A I've been with ICF since 1987
 (2) Q What is ICF Kaiser Engineers?
 (3) A It's an international consulting firm specializing in
 (4) engineering and construction and environmental investigations
 (5) Q Do you work with any particular group at ICF?
 (6) A Yes I work with the environmental group
 (7) Q What does the environmental group do?
 (8) A The environmental group focuses on environmental issues
 (9) We do site restoration site assessment clean up activities
 (10) that sort of thing
 (11) Q Do you have any technical specialties within the ICF
 (12) framework?
 (13) A Yes ICF specialist ICF specialist in sedimentary geology
 (14) stratigraphy
 (15) Q Does your work ever take you out to particular field sites
 (16) in various states?
 (17) A Well yes I worked in a number of states Worked in
 (18) Alaska California Oregon Washington Virginia Tennessee
 (19) variety of places
 (20) Q After high school what is your educational background?
 (21) A I received my bachelors from Ohio State University in
 (22) 1972 I received my masters from South Dakota Schools of
 (23) Mines
 (24) in 1978
 (24) Q And at Ohio State what did you study?
 (25) A I studied marine - well geology I specialized in marine

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- (1) geology and geophysics
 (2) Q How about at South Dakota?
 (3) A Economic geology
 (4) Q How would you define the study of geology?
 (5) A Well geology basically is the study of the history of the
 (6) earth The portion that I deal with is that which deals with
 (7) soft rocks sedimentary rocks sediments sand and gravel
 (8) beach interaction that sort of thing
 (9) Q And marine geology specifically would you define that for
 (10) us?
 (11) A Well that is a study that relates to the what we'll call
 (12) the lithosphere or rock or solid parts of the earth or ocean
 (13) Q And have you asked that I prepare an exhibit which shows
 (14) some of your experience working in Alaska?
 (15) A Yes I have
 (16) Q And is Exhibit 6027 that document?
 (17) A Yes it is
 (18) Q I'm going to use the Elmo to show that so we can move
 (19) quickly through your qualifications I'm not sure I'm going to
 (20) get all of Alaska on the screen at one time Let's start with
 (21) the northern part of the state
 (22) With reference to 6027 Mr Bush can you explain what the
 (23) dots mean and very briefly what your experience has been in
 (24) various locations within the state?
 (25) A Yes the dots that are located on the northern part of the

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- (1) state represent Air Force bases that I investigated in the past
 (2) few years primarily dew line sites They are indicated by
 (3) number 1 The numbers 2 3 and 4 represent specific areas that
 (4) I investigated while I worked with Atlantic Richfield I dealt
 (5) primarily there with beach interaction shoreline processes and
 (6) using the modern environment to interpret the ancient rocks
 (7) that are buried in the subsurface
 (8) The dots on the left are the Seward Peninsula in the
 (9) vicinity of Nome Number 7 and 6 represent investigations I
 (10) conducted for detailed stratigraphic investigations actually
 (11) for precious metals specifically horizons and sediments that
 (12) are preserved with respect to their value We determined the
 (13) value of properties in those areas
 (14) Numbers 5 and 8 represent similar investigations in the
 (15) interior of the state where we focused on stream deposits
 (16) primarily in those areas
 (17) Numbers 9 and 12 refer to coastal investigations done with
 (18) respect to precious metal preservations again looking at
 (19) specific stratigraphic horizons
 (20) And 10 and 11 refer to investigations done for the oil
 (21) spill
 (22) Q What period did you work for Atlantic Richfield that you
 (23) described - 2 3 and 4 sort of on the North Slope?
 (24) A That's correct. Approximately 1982 I believe until 1985
 (25) Q And the dew line investigations that you described was it

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- (1) for the Air Force?
 (2) A That's correct Those investigations were done for AFCEE
 (3) which is the Air Force Center for Environmental Excellence We
 (4) were asked to investigate those sites They were largely
 (5) coastal investigations and they have concomitant releases as
 (6) well as landfills and similar things releasing into the
 (7) environment
 (8) Q Besides the Air Force has other governmental agencies
 (9) asked for your assistance in other projects where your geology
 (10) background has been used?
 (11) A Yes we've been retained by - well perhaps the largest
 (12) volume of our work has been for the EPA the government
 (13) agency
 (14) the EPA Environmental Protection Agency In addition to that
 (15) we've been retained by the Department of Energy the
 (16) Department
 (17) of Defense National Laboratories Hanford Los Alamos
 (18) Q And has this work involved the investigation of property
 (19) impacted by oil or similar pollutants?
 (20) A Yes The investigations deal with hazardous waste in
 (21) total but by and large most sites are contaminated with
 (22) petroleum based materials
 (23) Q Can you estimate how many sites you've been involved
 (24) where
 (25) petroleum based materials were the contaminant?
 (26) A Well the range of contaminants varies widely from heavy
 (27) metals to fuels but virtually every site has some component of
 (28) petroleum based materials

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- (1) Q Does your investigation include investigation of sites
 (2) where there are impacts to the marine near shore environment?
 (3) A Yes
 (4) Q Can you briefly describe that as well?
 (5) A Well I can think of three offhand Let s see I was
 (6) involved in an EPA project that looked at a large number of
 (7) refineries a number of those were coastal installations with
 (8) their waste disposal facilities virtually on or very near the
 (9) tidal zone
 (10) I investigated a chemical industrial facility in Puget
 (11) Sound that was releasing caustic materials directly into the
 (12) intertidal zone The impact was so severe we were instructed
 (13) by direct order from the court to install a steel barrier to
 (14) extend into the ground for a leach agent for the tidal zone
 (15) Q You mentioned down at the bottom of the exhibit that you
 (16) had done some investigations in connection with the Exxon
 (17) Valdez oil spill?
 (18) A That s correct
 (19) Q And over what period have you worked on looking at some of
 (20) the sites affected by the spill sir?
 (21) A Well we started in 1989 The areas indicated by number 10
 (22) were investigated in 1989 In addition to that we conducted
 (23) investigations in 1992 1993 and 1994
 (24) Q And would those be in the areas numbers 10 and 11 on the
 (25) map?

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- (1) A Yes In 1992 we extended our investigations to include
 (2) both 10 and 11
 (3) Q And did you prepare various reports for the entities that
 (4) asked you for the investigations in the Exxon Valdez oil spill
 (5) area?
 (6) A Yes we did
 (7) Q In addition to your own investigative work with respect to
 (8) pollutants and the marine near shore environment and
 (9) specifically that with the Exxon Valdez oil spill have you
 (10) also reviewed the activities of others who have done work
 (11) looking at the fate and persistence of the Exxon Valdez oil?
 (12) A Yes we have
 (13) Q And whose work have you studied?
 (14) A Well I don t know that I can recall everyone s work at
 (15) this moment We have examined the natural resource damage
 (16) assessment studies beach treatment data that were released
 (17) by
 (18) Exxon managed by VECO Alaska Department of Fish & Game
 (19) Alaska Department of Environmental Conservation the joint
 (20) agency field programs and work done by ADEC exclusively
 (21) Q Is ADEC the Alaska Department of Environmental
 (22) Conservation?
 (23) A I m sorry that s correct
 (24) Q When you said that you looked at the Trustees work was
 (25) that the same group that Dr Peterson described the
 (26) governmental studies of the oil spill?

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- (1) A Yes natural resource damage assessment that s correct
 (2) MR JAMIN Your Honor without further ado I m going
 (3) to ask that Mr Bush be recognized as an expert in marine
 (4) biology
 (5) MR NEAL Any questions I have I ll save for later
 (6) for He s been offered as a marine geologist?
 (7) THE COURT That s correct and the Court will accept
 (8) his qualifications as a marine geologist
 (9) BY MR JAMIN
 (10) Q Before we go any further I want to get the definition
 (11) out I used the term fate and persistence in questions about
 (12) what you looked at What do you mean by fate and persistence
 (13) when you use them in the oil context?
 (14) A Well they become terms of art so to speak in the
 (15) environmental investigative field Fate deals with the
 (16) ultimate destination or outcome of a contaminant which
 (17) typically referred to as a spill or release Persistence
 (18) refers to how long that contaminant persists in an area
 (19) remains in an area or interacts with the environment It may
 (20) not necessarily remain in one place but how long it interacts
 (21) with the environment.
 (22) Q When you re confronting a site that has spilled
 (23) contaminants in a marine near shore environment what are the
 (24) main factors that you consider in looking at that and trying to
 (25) assess it sir?

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- (1) A For spilled contaminant in a marine environment?
 (2) Q Yes sir
 (3) A Well I guess really there are a large number of things
 (4) but to condense a long story into a short answer you would
 (5) look at three things The nature of the contaminant the
 (6) nature of the environment and then you try to unravel how the
 (7) two interact
 (8) Q Let s get an idea of the kind of environments that we re
 (9) dealing with and to some extent that you ve studied in Prince
 (10) William Sound Before we go into the specifics are the
 (11) beaches in Prince William Sound and the northern Gulf of
 (12) Alaska are they uniform sir uniform composition?
 (13) A No they are not.
 (14) Q What are the important types of differences that you
 (15) experience?
 (16) A Well there are a large number of differences The beach
 (17) is very tremendous I guess to again simplify a complicated
 (18) answer a large number of them are dominated by rocks sheer
 (19) cliffs very resistance materials not subject to wave erosion
 (20) and we have large and sandy grain These occur in different
 (21) amounts in different locations and then there is every
 (22) spectrum in between So it s important to recognize the
 (23) difference between for example large sheer cliffs and
 (24) shorelines that are made of large blocks or pieces that have
 (25) fallen off and incorporated sand or gravel with those ones

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- (1) that are dominantly smaller particles cobbles gravel pebble
 (2) that sort of things coarse sands fine sands and then sands
 (3) Q Have you asked that I make available pictures for what you
 (4) just made a word picture of?
 (5) A Yes
 (6) Q Here is 2125 125 If you could explain what we re seeing
 (7) here?
 (8) A Yes this is a photograph of what we ll call a bedrock
 (9) dominated beach and I ll - I know most people think of a
 (10) beach the idea of California and Florida comes to mind but in
 (11) fact this is a type of a beach and we re showing this picture
 (12) particularly to illustrate that not all solid rock beaches are
 (13) vertical Some of them have nice general slopes like this one
 (14) Q Let me show you next another one of the photographs that
 (15) we ve seen before and if you could focus on the beach here?
 (16) A Yes This one illustrates a number of things You could
 (17) see we re beginning to make the transition here from a solid
 (18) rock to one that has large blocks The lower portion of the
 (19) illustration you can see the fractures and the large boulders
 (20) Volkswagen size boulders
 (21) Q Are those to the right of the bear?
 (22) A Yes based on the size of the bear And logs and material
 (23) that has washed up on shore indicating something about
 (24) energy
 (25) or tide level And higher in the illustration you can see
 (26) beginning textural mix where we have both medium size
 (27) boulders

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- (1) Q Is this up here?
 (2) A Yes and some sand and gravelly type materials I can t
 (3) tell for certain from the illustration but we have a variety
 (4) of grain sizes
 (5) Q So that gives you a heterogeneity look at the beach then?
 (6) A Absolutely correct
 (7) Q Let me ask to you look at the next one and if you can
 (8) take us through that one
 (9) A This is one of our transect sites on Point Helen which is
 (10) the tip of Knight Island You can gain clearly an idea of the
 (11) sizes of the boulders medium to large boulders using the
 (12) cooler for scale there What s interesting with this
 (13) particular photograph is beneath the boulders we see in the
 (14) pit in the area that s been excavated from the pit pebbly
 (15) size material sand and gravel This particular beach has one
 (16) characteristic one beneath it finer grain
 (17) Q And finally sir our last beach composition picture let s
 (18) see if I can get a portion in that actually shows the beach
 (19) and let me try and focus a little better Go ahead
 (20) A In this illustration we ve made the leap from boulders to
 (21) sandy environment obviously pebble sized environment in
 (22) between which we don t have but this will illustrate a sandy
 (23) environment wide expansive very long you can see from the
 (24) illustration and the finer grain sizes indicated by the
 (25) smaller ripples we have on the surface

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- (1) Q Now besides the composition of the beach which you ve
 (2) described for us is the exposure of the beach an important
 (3) issue?
 (4) A Yes To classify shorelines with respect to how they will
 (5) respond to impact of contaminant or for a variety of other
 (6) purposes exposure is a major major item and broadly
 (7) speaking most shorelines can be characterized two ways
 (8) those
 (9) well-exposed and subject to high energy large wave action
 (10) severe storm action versus those that are not So you have
 (11) protected or sheltered environments versus those that are
 (12) exposed to high energy
 (13) Q And again have you asked that I get a series of pictures to
 (14) explain that?
 (15) A Yes
 (16) Q Let s take a look first at this one and if you could
 (17) explain what that is?
 (18) A Yes this one illustrates a couple of things First off
 (19) you can see we have a mixed clastic environment. By class -
 (20) clastic sedimentary rock sand and gravels, so that s a
 (21) clastic environment.
 (22) Above that we can see as we move into the upland area it
 (23) shows you the impact of storms or higher tide action that can
 (24) produce particular structures that parallel or give you this
 (25) contour like surface of a shoreline They represent the
 (26) different water levels at the time of high tide one feature

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- (1) being the logs that we can see across the top Although this
 (2) picture doesn t represent it clearly they can be arranged at a
 (3) wrack line that s w r a-c k line and that refers to an
 (4) elevation where the highest point of the tide interacts with
 (5) the tide and demarcates the tide level
 (6) Q And another one of the photographs and what does that
 (7) depict sir?
 (8) A This is a shot of an area interior in Prince William Sound
 (9) and gives you some examples of the heterogeneity the
 (10) variations along the shorelines We can see many small
 (11) pockets
 (12) or beaches small embankments So in terms of exposure we
 (13) have a different - different parts of it exposed to the large
 (14) size body of water totally other parts are sheltered or
 (15) protected from that quieter variety
 (16) In response to this difference in exposure you find
 (17) bedrock or rocky shorelines contaminated by rocks depends
 (18) which might be pockets of gravel and sand which may be able
 (19) to
 (20) absorb contaminant into the shoreline
 (21) Q And the third picture in this area what was the
 (22) significance of this picture for you sir?
 (23) A Well there are a number of significant features
 (24) illustrated here In terms of exposure if we look at the
 (25) direction of the currents the winds and the waves in this
 (26) case we can see the upper end in the photograph of the island
 (27) is fairly exposed also quite rocky

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- (1) Q Right here sir?
- (2) A Yes that s correct
- (3) Q Okay
- (4) A In other words that area maybe more subject or subject
- (5) more frequently to storm action So it s resistance the
- (6) material that can survive that is bedrock hard strong
- (7) dominant material but on the leeward or on the down side -
- (8) Q Is this here where I m pointing with the pen?
- (9) A No further Right there
- (10) Q Okay
- (11) A Even though we re still on the windy side of the island
- (12) just on the backside of those rocks the areas immediately
- (13) protected from the wave action so within those little
- (14) embankments the uppermost one that you see there there is in
- (15) fact a small pocket beach of cobbles of gravel something like
- (16) that Moving down the island you ll see the end of the
- (17) island where counsel initially pointed is largely gravelly
- (18) and sandy or clastic material as opposed to the rocky
- (19) So here in a small island we see a variety of environments
- (20) all respond differently to oil You can see that the oil is
- (21) being released in the island after having been oiled already
- (22) So we can see that oil released from the upper portion of the
- (23) photograph actually can move down some cases and interact
- (24) with
- (24) the sand and gravelly environment on the southerly or down
- (25) side
- (25) of the photograph

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- (1) So oil released from one oil spot precontaminates the
- (2) southern portion This particular photograph is a shot in
- (3) time The tidal range in that location may be 12 10 15
- (4) feet So the effect that you see is smeared up and down the
- (5) shoreline of the - over the entire tidal range just not at
- (6) that location It happens vertically throughout the range
- (7) Q When you look at a particular beach at a particular time of
- (8) the tide can you tell what sort of beach it is?
- (9) A At a particular time of tide some beaches some
- (10) environments you can be fairly certain that on an immediate
- (11) investigation you can tell but there are many environments
- (12) where you can be grossly misled
- (13) Q And does this picture help you to explain this phenomena?
- (14) A Absolutely yes
- (15) Q In what way?
- (16) A Well the lower portion of the picture is - the shoreline
- (17) in the lower portion of the picture is dominated by very coarse
- (18) rocks gravel boulders and that sort of thing but the upper
- (19) half of the photograph is a sheer cliff If you approach this
- (20) shoreline during mid to high tide phases you would see a
- (21) bedrock dominated cliff However if you came back during
- (22) lower tide you would see it s a mixed environment the lower
- (23) portion being largely a clastic environment sand and boulders
- (24) clastic and mixed This is an example that s particularly
- (25) problematic for the way the shorelines have been mapped and

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- (1) interpreted in Prince William Sound because all of the mapping
- (2) done to date has defined the shoreline types along their
- (3) length In other words moving from one point down the shore
- (4) along the shore to another point and classified it as a
- (5) particular type rocky fine sand and gravel this sort of
- (6) thing
- (7) This particular shoreline vanes up and down so any
- (8) description of the type of shoreline along this length has to
- (9) display two types of shoreline for the segment It s
- (10) complicated and it s complicated to work with and complicates
- (11) the analysis
- (12) Q Besides the beaches and the exposure that you ve told us
- (13) about so far are there other factors that are important as you
- (14) categorize beaches in Prince William Sound and the northern
- (15) Gulf of Alaska?
- (16) A Well certainly There are tremendous number of factors
- (17) that impact how one would classify shorelines I think to
- (18) discuss some of the main ones the slope of the beach is a
- (19) major factor Very steep beaches over a tidal range of say 10
- (20) to 15 feet may have only a slight amount more of shoreline
- (21) that s exposed to the tidal range because they are very steep
- (22) the tidal range is something like this relatively close to the
- (23) tidal range 20 feet Very low slope beaches have a tremendous
- (24) amount of beach exposed over that same tidal range
- (25) So if as though you re flooding a street a low flat street

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- (1) floods easily and it s contained in the curbs but once it gets
- (2) outside the curbs it spreads all over the place These
- (3) shorelines behave the same way And they have a tremendous
- (4) amount of surface area that is exposed to this tide range
- (5) steep ones much less
- (6) The orientation of the beach is another factor If in
- (7) Prince William Sound major storms come out of the northwest
- (8) north northeast for shorelines that are exposed to the south
- (9) or on the southern side of these things like the island that
- (10) we looked at earlier that orientation would be subject to a
- (11) different set of storm and wave activities So its stability
- (12) will be different from those of the dominant directions
- (13) Orientation low tidal range how those interact other
- (14) factors but that gives you an example of how it can complicate
- (15) beach analysis
- (16) Q Having gotten a sense of the structure and the important
- (17) characteristics of the beaches that we can take a look at
- (18) together let s talk for a moment about oil and I want you to
- (19) assume for the moment that there is a large release of oil in
- (20) Prince William Sound and I want to get an idea of what the
- (21) factors are which affect the oil as it leaves the vessel?
- (22) A Well referring to the Exxon Valdez spill?
- (23) Q That s a fine example for us here
- (24) A Well initially you have a buildup right around the vessel
- (25) where it s being spilled at the spill point It pours out at a

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(1) certain rate and ends up around the vessel and spread
 (2) laterally This is a fairly typical occurrence in the case
 (3) of flat water or calm environments it builds up around the
 (4) spill point and spreads out laterally on the surface
 (5) In the case of an aerial view one would see color
 (6) variations on the surface that would show a thicker a darker
 (7) mix of oil around the point of spill and release versus thinner
 (8) occurrences on the edges In time and with reduced rate of
 (9) relays this material is spread out as a thin film on the
 (10) surface
 (11) As the water begins to agitate the oil maybe incorporated
 (12) into the water and the water maybe incorporated into the oil
 (13) Under severe agitation or strong agitation we will have an
 (14) emulsion or a form that s referred to as mousse It s
 (15) brownish It s named after chocolate mousse because of its
 (16) consistency and appearance It has the consistency of
 (17) mayonnaise and consists of 50 to 60 percent water perhaps as
 (18) low as 30 in some cases mixed in with oil in droplets
 (19) Another emulsion that occurs is where water is dominant
 (20) oil being the lesser and gives it a milky appearance There
 (21) are other changes that occur We have evaporation for
 (22) example within the oil slick after it s released In the case
 (23) of this particular spill approximately 20 to 25 percent of
 (24) material is thought to have evaporated There is a gradient
 (25) within that evaporation however The material that is out on

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(1) the thin edges of the slick is more easily accessible to wear
 (2) and more volatile it can be released whereas there is some
 (3) dissolution of volatility in this particular portion of the
 (4) slick You have dissolved this portion of the slick
 (5) Anakolades (ph) and other portions of the slick are more
 (6) suitable more or less and these can dissolve and occur in the
 (7) water phase
 (8) As the wind picks up the slick - all these processes go
 (9) on at the same time more or less As the wind picks up the
 (10) slick will actually move across the surface of the water in a
 (11) variety of ways The water surface itself moves There is
 (12) always sheer between the slick and the water surface And the
 (13) speed of the slick itself may not be the speed of the water
 (14) movement The dissolved phases or suspended phases of
 (15) emulsions that are in the water may move in response to current
 (16) differently than the slick itself moves So you ve got a real
 (17) mixture of events going on here some abeyed current paths
 (18) some abeyed wind directions and there is a response to how
 (19) each of those responds to both of those
 (20) Q Does a portion of 228 which we ve seen previously explain
 (21) some of the concepts you ve described?
 (22) A Yes it does
 (23) Q In what way sir?
 (24) A Well we can look at a number of things here To give you
 (25) some idea of the differentiation in the movement between the

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(1) Slick itself and the water surface these windrows the long
 (2) streamers that come off generally represent portions where the
 (3) oil itself is flowing in response to a windrow in a phase or in
 (4) a mechanism that dominates water movement. In other words
 it
 (5) overrdes the water movement it follows windrows basically
 (6) The different colors represent different thicknesses The
 (7) rainbows represent thinner thicknesses versus the solid brown
 (8) or darker portions which represents thicker portions
 (9) Q Now we ve already seen from some of the photographs that
 (10) eventually some of this oil hits the shoreline and I want to
 (11) take a second Have you identified some photographs to show
 to
 (12) the jury to explain that process sir?
 (13) A Yes
 (14) Q Let me start with the first You ve seen this before from
 (15) Miss Fobes can you explain that?
 (16) A Yes this is an excellent example of a mousse wrack, give
 (17) you some idea of the size of the mousse It s a surface layer
 (18) the dark stuff with the brown ripples It s the water/oil
 (19) emulsion I talked about where water is the dominant phase and
 (20) moving adjacent to the shoreline in this example
 (21) Q And the next one sir?
 (22) A This also represents mousse on the water surface You can
 (23) begin to see the mousse retains a viscosity or a thickness and
 (24) consistency like mayonnaise It floats on the surface little
 (25) bit of relief that you can see

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(1) Q Let me try and work with the focus
 (2) A In the darker area there you can see there is actually
 (3) relief between the top of the mousse and the water surface a
 (4) fraction of an inch or so
 (5) Q And this is the difference between this section and this
 (6) section for example?
 (7) A That s correct
 (8) Q Now as the mousse or the other forms of the oil comes in
 (9) contact with the shore does some of it get deposited on the
 (10) shore?
 (11) A Yes
 (12) Q Can you take a few minutes to explain how the crude oil is
 (13) deposited on the shore for us?
 (14) A Yes I can
 (15) Q All right
 (16) A Can we refer to one of the exhibits?
 (17) Q Yes we can Have you prepared an exhibit to explain this
 (18) process?
 (19) A Yes we have
 (20) Q Then we ll get an easel up
 (21) Is this that exhibit sir?
 (22) A Yes it is
 (23) Q If you d like to come down from the stand with the Judge s
 (24) permission to explain the exhibit - it may be that we need
 (25) two of these

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- (1) A If you want to hold them
 (2) Q Why don't I hold it for you and then we'll be fine
 (3) A You could just hold it -
 (4) Q Provide a stiff backboard for you Does that work?
 (5) A So far
 (6) Q Go ahead
 (7) A This exhibit is a four part exhibit and will give you the
 (8) basic understanding of what happens as oil impacts shorelines
 (9) If you remember in my discussion earlier about the different
 (10) shoreline types and it's more complicated than I've led you to
 (11) believe so far this illustration indicates a variety of those
 (12) aspects This will be a cliff like area of exposed bedrock
 (13) You can relate the shape of this to what we saw in the little
 (14) photograph of the island and the top of the photograph where
 (15) those ridges were extending out into the photograph be
 (16) something like this This will be another piece of bedrock
 (17) sticking up here This might be a large block that's calved
 (18) off from a fracture and fallen into the shoreline
 (19) This here is strewn with cobbles and boulders a mixed
 (20) variety of sizes This cobbly and bouldery picture represents
 (21) a stable surface on which we have a link called intertidal
 (22) swash bar Just imagine that as being a sand dune moves just
 (23) like a sand dune only under water from wave action It
 (24) typically will be finer grain with respect to the material that
 (25) makes up this surface So that this surface is relatively

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- (1) stable in comparison to the movement of this body So this
 (2) little sand dune or swash bar can move along the surface in
 (3) wave energies that will affect the surface directly
 (4) These shaded areas in the upper reaches represent those
 (5) wrack lines I talked about earlier So when the tide comes up
 (6) on a certain elevation this might be the location last
 (7) highest tide for example and then material that was floating
 (8) on the water with the wind blowing toward shore will be caught
 (9) at this point and leave a line that marks that high tide
 (10) point
 (11) Previous in the month we may have had a spring tide
 (12) exceptionally high tide and that would be denoted by this
 (13) (indicating) and similarly strong wind or storm material
 (14) deposited at this higher elevation So these depict
 (15) historical maybe yesterday maybe six hours ago maybe a
 (16) week ago So in this case think back to the photograph we saw
 (17) earlier with the mousse wrack floating
 (18) Q Is this what you meant?
 (19) A Yes maybe something similar to what we see here liquid
 (20) oil or a combination of the two In this illustration I've
 (21) drawn this scenario with the rising tide Similar things can
 (22) happen with regard to the tide cycle and did I'll move this
 (23) way
 (24) Here we see step two in the process We see that the patch
 (25) of oil has moved closer to the shoreline that it's in the wave

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- (1) active zone that the waves now are breaking up against the
 (2) shoreline and we can see with this swash zone and that's the
 (3) point after the broken wave where the water actually washes up
 (4) the surface of the beach and carries the oil to these areas
 (5) These areas would represent splash material This is a piece
 (6) of bedrock here that's sticking up higher the tip of it has
 (7) already been oiled with splash action pretty straightforward
 (8) The next step we can see we've reached high tide the high
 (9) tide reached this level and that is the point oil was splashed
 (10) up in a higher place represented by the splash marks and we
 (11) can see as the tide comes in the oil is deposited here
 (12) hydrostatic pressure develops by the weight of the water some
 (13) of it is driven into the shore as the water percolates into the
 (14) sediment At the same time some of the oil is floated back up
 (15) in the surface only to be caught into the wave action and be
 (16) caught in the shoreline So we have a system here that's
 (17) recycling the oil into the beach and further up into the beach
 (18) this happens as the oil impacts the beach
 (19) Now in this section we're seeing it later in time as the
 (20) tide has fallen We still have the same waves not depicted
 (21) here as clearly these guys are still there We have the swash
 (22) that washes up on the beach but it has an opportunity now to
 (23) percolate down on the beach as the ground water drains from the
 (24) beach during the falling tide So this is the time when the
 (25) oil has the greatest opportunity to penetrate into the

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- (1) sediments that make up the beach Now bearing in mind we're
 (2) showing here penetration into the sands Obviously something
 (3) as hard and impermeable as bedrock the same thing cannot
 (4) occur except we have cracks and fractures and that sort of
 (5) thing I think that takes care of it
 (6) Q Thank you You can resume your seat again
 (7) Have we identified some photographs to demonstrate some of
 (8) the processes that you've described?
 (9) A Yes we have
 (10) MR NEAL What was the last exhibit number?
 (11) MR JAMIN The exhibit number was 253 I believe
 (12) Mr Neal It is 253 and actually I can move for its
 (13) admission Your Honor
 (14) (Exhibit 253 offered)
 (15) THE COURT Objection?
 (16) MR NEAL No objection
 (17) THE COURT Exhibit 253 is admitted
 (18) (Exhibit 253 received)
 (19) BY MR JAMIN
 (20) Q Now I think the last picture we saw was the mousse coming
 (21) in Can you explain to us what we're seeing from a geologist's
 (22) view rather than a National Geographic photographer's view?
 (23) A Yes This indicates a situation where the oil has come in
 (24) perhaps on a rising tide and the wrack lines that I referred
 (25) to earlier on the beach or the lines that demarcated the

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- (1) highest elevation of the tide are actually quite straight
 (2) quite precise and as you can see in this illustration during
 (3) the time of calm water we had a very nice sharp line
 (4) delineating the oil band where the oil rose with the highest
 (5) tide to that elevation You can see laterally on the edges of
 (6) the photograph some large rock outcrop where penetration
 would
 (7) be confined principally to cracks and whatever permeability
 was
 (8) available to the rock itself
 (9) But to the rest of that in the view of the photograph you
 (10) see we have a gravelly cobbly boulder environment where we
 (11) can have more penetration into the sediments and a larger
 (12) volume of oil will be retained in that environment as opposed
 (13) to the rock part
 (14) Q And the next photograph sir?
 (15) A This is an illustration of oil pooled behind the cobbles
 (16) and perhaps there is some small boulders in this but the key
 (17) point is that puddles of oil are trapped in this matrix of
 (18) framework and have an opportunity to percolate down if it's
 (19) mixed with sand and finer grain it's reduced To the extent
 (20) it's gravel and cobbly the porosity is larger - a large
 (21) amount of oil can penetrate into it.
 (22) Q Finally how about this one from the view of a geologist?
 (23) A Similarly we see the case of sandy and looks like a
 (24) coarse grain sand pearl The oil has drained into this coarser
 (25) material

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- (1) Q Now you've indicated I think in your testimony that some
 (2) of the oil drains down into the lower material Do you have
 (3) some photographs to show that a little better as well?
 (4) A Yes
 (5) Q Let me show you the first of those
 (6) Counsel this is previously admitted 6020
 (7) A Yes this is a particularly interesting photograph This
 (8) is a photograph we took I believe it's either - I think it's
 (9) a 1994 photograph I believe of one of our transect areas of
 (10) Eshamy Bay in Prince William Sound From the standpoint of
 oil
 (11) percolation and how the oil gets in the beach we see this
 (12) layer of cobbles and boulders fairly well round If you look
 (13) in the hole where we see the sheen the margins are made up of
 (14) fine grain sand This is an excellent example of what you
 (15) referred to earlier in the illustration We saw this bouldery
 (16) cobbly surface with finer grain material this surface
 (17) (indicating) this shields this sandy material from wave action
 (18) and adds stability to the beach So the oil that's penetrated
 (19) in the environment little difficult to see here because we're
 (20) in 1994 But if you look in areas around the - is there a way
 (21) I can point to -
 (22) Q Actually if you'd like to come up and use the large
 (23) screen I think the jurors can see that and that might be the
 (24) best way if you have your pointer
 (25) A Sure Well this is the rock that was exhumed from the

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- (1) hole this is the hole the rock came from this is the sandy
 (2) material around the margins we've observed to be fairly
 (3) consistent through 1989 around this beach But in addition to
 (4) that the areas in here and here this smaller pebbles smaller
 (5) classes are all bound to be pregated because the sediment
 was
 (6) pregated with oil So in 1989 when the site was oiled the
 (7) oil percolated through the armor into the sandy and smaller
 (8) class environment and now is serving as a glue to help bind
 (9) things together and adds further stability to the beach
 (10) Q Let me show you the next photograph and at the - for
 (11) Counsel's preparation identify it at 6022 which has been
 (12) preadmitted
 (13) Is this also from 1994?
 (14) A Yes
 (15) Q Can you explain what we're seeing here?
 (16) A This photograph is taken I think on the - this one was
 (17) taken - well we visited this site two times on the - about
 (18) the 25th or 26th of May this year and then again on the 2nd of
 (19) June of this year I think this one was taken on the 2nd of
 (20) June I can't read the indication at the bottom of the
 (21) photograph of this screen
 (22) Q I believe it's 6/2/94?
 (23) A 2nd of June The rock that you're looking at is a boulder
 (24) that we turned up earlier about approximately a week prior to
 (25) that and the bottom side of that rock is covered with mousse

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- (1) If you think back about the wrack of mousse that we saw earlier
 (2) in those photographs same kind of material remains on the
 (3) bottom side of this boulder
 (4) The rocks in this area although they appear to be clean on
 (5) the surface are in fact bound and saturated beneath the
 (6) immediate surface with oil residues and this material at the
 (7) bottom of the rock has been exposed to wave action It's
 (8) mayonnaise consistency that sort of thing for approximately
 (9) six days since it was turned up and it still persists there on
 (10) the bottom side of the rock with little to no protection
 (11) So the material beneath these rocks and beneath this
 (12) armored surface has the ability to persist there for a much
 (13) longer period of time
 (14) Q Let me show you 6023 and is this also from 1994 sir?
 (15) A Yes it is
 (16) Q And can you explain to us what we're seeing here?
 (17) A Yes this is a photograph which was taken from a site on
 (18) the northeast end of LaTouche Island and again the rocks look
 (19) fairly clean on the surface We see in the center portion of
 (20) the picture a small puddle of water with sheen on it That
 (21) sheen was natural It occurred there in an undisturbed
 (22) manner We did not disturb the area It was there when we got
 (23) there on the site The reason the water is there because the
 (24) sediments around there are saturated with oil residues and
 made
 (25) impermeable

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- (1) Q Finally Exhibit 6025 which has been preadmitted is this
 (2) from 1994 as well sir?
 (3) A Yes it is
 (4) Q Where is this and what are we seeing?
 (5) A This is a photograph of a pit that we dug at our Point
 (6) Helen transect on the southern end of Knight Island and that s
 (7) approximately I would estimate 40 centimeters by
 (8) recollection and the brown spots that you see on the water are
 (9) oily material that are exuded from the sediments and are now
 (10) floating on the surface of the water
 (11) At this time the tide level is approximately 6 to 8 feet
 (12) by recollection below that water level So that s actual
 (13) ground water that s in the beach
 (14) Q Now you ve shown us some evidence of persistence of the
 (15) oil on the beaches that we ve described Is there as well some
 (16) natural cleaning which occurs?
 (17) A Well certainly there is To the extent that the
 (18) shorelines are subjected to wave action and high energy and
 (19) abrasive action of fine grain material there is natural
 (20) cleaning We were in fact very pleased to see some later
 (21) sites that the surface had been cleaned up Largely it s been
 (22) combined to surface aging
 (23) Q Can you explain to us how the cleaning occurs as a natural
 (24) process?
 (25) A I m not sure I follow the question completely As a

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- (1) natural process there is an interaction of wave action and
 (2) agitation of the sediments and it s this agitation or movement
 (3) that allows the oil to abrade and be removed from the rocks
 (4) There are biodegradation activities exposure to sunlight
 (5) photo interactions that cause degradation to the oil materials
 (6) and other things
 (7) Q And does this this natural cleansing of the beaches or
 (8) the surface of the beaches dies that lead to the
 (9) re integration or recycling or recircling of the oil back into
 (10) the water environment?
 (11) A Well in some cases that s correct yes For example as
 (12) we ve seen some of these heavily impregnated areas If a
 (13) severe storm or a particularly oriented or unique storm would
 (14) disrupt some of these or disrupt that it could be broken loose
 (15) and transport almost as particulate matter in the Sound or
 (16) small globules of the mousse either to flow out into the
 (17) environment or move down shore to the beach where it s been
 (18) replaced in the first place
 (19) Q That picture that we saw a little while ago of the island
 (20) where the oil seemed to be streaming off is that evidence of
 (21) the recirculation? Let me show that to you once again
 (22) A Yeah it s an example of it as I mentioned earlier The
 (23) oil that s being released from the top portion of the
 (24) photograph on the right hand is a great opportunity to come
 (25) down and intersect the clastic shorelines on the bottom here

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- (1) Stuff which is released from the end of the island that moves
 (2) onto deep water or into other shorelines
 (3) MR JAMIN Your Honor we re ready to start a new
 (4) visual
 (5) THE COURT Take our first recess now Ladies and
 (6) gentlemen we ll be in recess for 15 minutes
 (7) (Jury out at 10 03 a m)
 (8) (Recess at 10 03 a m)
 (9) (Jury in at 10 15 a m)
 (10) THE CLERK All rise
 (11) THE COURT Okay
 (12) MR JAMIN I need a witness
 (13) MR SANDERS He was leaving as I was coming
 (14) MR JAMIN This is before the cross-examination
 (15) BY MR JAMIN
 (16) Q Mr Bush before the break we were describing this process
 (17) that by which some of the oil was recirculated or recycled back
 (18) into the environment Is that something that occurs just with
 (19) storms?
 (20) A No it is not
 (21) Q How else does it occur sir?
 (22) A Well for example in 1994 we were on site and some of the
 (23) photographs as you saw earlier indicated that there were small
 (24) amounts of sheen and small puddling of sheen these can be
 (25) released on a tidal cycle basis whether or not a storm has

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- (1) impacted the area
 (2) Q Let me ask you to if you have prepared an exhibit to
 (3) explain to the ladies and gentlemen of the jury how the oil
 (4) ends up persisting on some of the beaches?
 (5) A Yes
 (6) Q I guess we ll get our backboard The number on this one is
 (7) 6012 Counsel
 (8) If you d like to come down from the stand to explain this
 (9) exhibit
 (10) A Yes This exhibit is again similar to the other exhibit
 (11) with the block diagrams similar environment it presents to
 (12) you something that we ve already discussed
 (13) Q Could everyone see this?
 (14) A That s the notion of the arming or the strengthening of
 (15) the surface of the beaches Actually how this comes about is a
 (16) bit of a complicated process but we re going to start you mid
 (17) stream here in an imaginary situation and assume that we have
 (18) a
 (19) mixed sandy beach this beach just appeared It consists of
 (20) large rocks intermediate and small rocks and sandy material
 (21) which you can t see in the depiction Let s say this is a
 (22) fairly typical environment for Prince William Sound in terms of
 (23) wave energy and wave interaction on the shorelines
 (24) As time passes we see that some of the finer grain
 (25) material easily moved is removed from the setting As that
 happens and it can be transported alongshore moved
 offshore

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(1) a variety of ways as this happens the volume of the beach is
 (2) reduced this being - the dash line here being the original
 (3) surface A substantial portion is removed and now the new
 (4) surface is lower than it was before What has been removed
 has
 (5) been the finer grain material not the large rocks So the
 (6) cobbles and the boulders maybe even the pebbles in some
 (7) situations are retained on this surface as the sand is
 (8) whittled away from around them So the large stable rocks
 move
 (9) downward stratigraphically in my nomenclature move
 downward
 (10) So eventually we develop a fairly stable and strong surface
 (11) Now the material underneath has changed little it still
 (12) consists of the mixed sands and gravels just this surface
 (13) that s been created by the natural whittling process that goes
 (14) on This process goes on essentially all the time When you
 (15) hose sand off on your driveways the big ones hold back the
 (16) little ones wash away Same idea in this process The result
 (17) is that you have an armored or strengthened surface
 (18) You think back to the photograph where one of the rocks had
 (19) been turned out and there was a hole out there We had the
 (20) sandy material beneath the cobble/boulder layer so you get a
 (21) stabilizing feature to the shoreline In Prince William Sound
 (22) perhaps the largest number of waves that hit this will have
 (23) very little effect it s strong relative to this wave energy
 (24) Perhaps storm waves most storm waves also the surface will
 (25) become fairly stable with respect to most storm waves It will

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(1) take very high energy very large waves to actually completely
 (2) break up the surface and disrupt it It s a natural process
 (3) it s a natural event Mother Nature tries to achieve some
 (4) level of quasi stability near stability It s not perfect
 (5) it doesn t happen perfectly everywhere It s not perfectly
 (6) stable Sometimes we wind up with agitation and the surface
 (7) may always be at some intermediate stage in attempting to
 reach
 (8) the more stable surface but by and large this process
 (9) operates continuously all over the Sound
 (10) Now I want to be clear about one thing in this
 (11) illustration These pictures don t represent the size of the
 (12) waves just to give you some idea of the energy of the waves
 (13) Be misleading to think it required a wave this big relative to
 (14) these (indicating) to disrupt that beach What I m trying to
 (15) do is illustrate the differences of power or the energy of the
 (16) waves I think that s it
 (17) Q So this then gives us an idea how the beach can stabilize
 (18) with some of the oil retained below the surface?
 (19) A That s correct
 (20) Q Now you mentioned the photograph before actually when
 (21) you were making reference to the exhibit Is this the one to
 (22) which you were referring?
 (23) A Yes
 (24) Q And can you explain again with reference to the exhibit
 (25) what the purpose of the photograph is?

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(1) A Yes We can see the red ruler which is about six inches at
 (2) the base of the hole where the boulder on the right is in the
 (3) photograph it s the hole the boulder was pulled from Beneath
 (4) this armored surface is a variety of fine grain material
 (5) largely sandy material and it s a shade of a brown and you can
 (6) see it around the sheen where it s on the pool of the water
 (7) So the boulder represents the armor that keeps the finer grain
 (8) less stable materials in place
 (9) Q Let me take a few moments with you sir and ask whether
 (10) you in connection with your research and the review that you
 (11) described of others work with respect to the fate and
 (12) persistence of the crude oil you are able to describe to the
 (13) ladies and gentlemen on the jury the general path of the oil
 (14) from the Exxon Valdez over time?
 (15) A Yes
 (16) Q And what tools do you rely on to tell us about that what
 (17) have you reviewed?
 (18) A Well there was a variety of data but the hindcast study
 (19) for example work by Gault and others we ve looked at a
 (20) variety of data As I mentioned earlier across the Sound both
 (21) anecdotal people who have worked on cleanup crews as well
 as
 (22) ADEC data Alaska Department of Environmental Conservation
 and
 (23) Alaska Department of Fish & Game also provided both
 observation
 (24) data NOAA over flight data similar information
 (25) MR NEAL Excuse me just a moment Your Honor

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(1) aren t we getting beyond the area of Mr Bush s expertise? I
 (2) think he was offered as a marine biologist had to do with the
 (3) nature of the bottom of the ocean and substantial bodies of
 (4) water I think he s now talking about the path of the oil from
 (5) the Valdez
 (6) MR JAMIN Your Honor we re getting - my next
 (7) question is - he was offered as a marine geologist and he s
 (8) indicated how he studied the beaches and various areas I
 (9) think it s perfectly within his expertise
 (10) THE COURT I ll listen a little bit more before we
 (11) make a decision on this
 (12) BY MR JAMIN
 (13) Q Mr Bush what I d like to do is show a series of stills
 (14) from the HAZMAT video and if you could as we go through
 (15) explain the principal features of the land and to some extent
 (16) where you were involved in your research The first of which
 (17) I believe is a day after the spill?
 (18) A Yes if you look at the illustration this particular
 (19) method of depicting a spill illustrates the spill as a bunch of
 (20) small dots on the screen so that what we see here is a cluster
 (21) of many small dots in one place indicating a short time after
 (22) the spill and the oil is still relatively close or contained
 (23) in the vicinity of the Valdez
 (24) Q Let s have the next still This is 226 which has been
 (25) preadmitted sir This is the second day if you could

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- (1) describe that?
- (2) A Well two days into the spill now we can see that the slick
- (3) itself is beginning to become more diffuse among the edges
- and
- (4) is moving landward I e spreading out moving both to the
- (5) west and the small portions may in fact move eastward There
- (6) is no real direction or advent with wind or anything
- (7) particularly to mobilize -
- (8) THE COURT May I see Counsel please?
- (9) (At side bar off the record)
- (10) BY MR JAMIN
- (11) Q Mr Bush in the interest of the shortness of time and
- (12) life His Honor asked that we just identify a couple of the
- (13) frames along the way
- (14) Let me ask you this is in early April is it not? Can you
- (15) identify come down here off the stand and identify for us with
- (16) reference to the oiling that shows on the HAZMAT video where
- (17) some of the work that you did was in Prince William Sound sir?
- (18) A Yes This is Prince William Sound Bligh Island area
- (19) Bligh Reef where the impact happened We've investigated this
- (20) area in 1989 92 93 and 94 and the sites of investigation
- (21) that we had ranged from the north approximately Applegate
- (22) Island area through the Naked Island Knight Island the
- (23) islands to the north of this and Green Island LaTouche Island
- (24) and the collection of islands Edmonds Eleanor and others in
- (25) this vicinity all the way around These islands Montague

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- (1) Hinchinbrook sort of the barriers of the gulf to the Prince
- (2) William Sound were not particularly investigated in the spill
- (3) and to our knowledge were not heavily impacted
- (4) The principal areas we focused on were these areas where
- (5) the bulk of the spill passed through (indicating)
- (6) Q Now if you'd stay right there let's try to identify one of
- (7) the pictures out of the Sound If you just go forward That's
- (8) perfect Now this is still in early April is it not?
- (9) A Yes it is
- (10) Q And can you explain where you did some of your field
- (11) research with reference to this diagram?
- (12) A Yes this photograph the areas depicted in this
- (13) illustration Prince William Sound is up here We moved to the
- (14) southwest from Prince William Sound this being the Kenai
- (15) Fjords This represents the portions of the slick that are
- (16) moving in this area We've investigated several sites down in
- (17) here Morning Cove Bench Cove (ph) Taroka Arm Windy Bay
- (18) Rocky Bay Port Chatham
- (19) Q In subsequent years did you investigate into the Kodiak
- (20) archipelago and the Alaska Peninsula?
- (21) A Yes Cape Douglas and the Alaska Peninsula and a variety
- (22) of sites that occur off the illustration to the southwest as
- (23) well as portions of the Kodiak group here Kodiak Shuyak and
- (24) Afognak
- (25) Q Just one more question on this and we'll move all this

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- (1) exhibit Have you looked at the entire HAZMAT exhibit the
- (2) entire video?
- (3) A Yes I have
- (4) Q Does it show with the dots the locations of all the oil
- (5) that you found sir?
- (6) A No it does not It's usable as a broad indication of the
- (7) oil spill path Gives you some indication of the series of
- (8) events that happened after the release I don't think it's
- (9) purpose was to depict entirely the full introduction of the oil
- (10) where it went
- (11) Q If you would like to take the stand again and I just have
- (12) one another area Mr Bush that I would like to go into with
- (13) you
- (14) You mentioned that you had been out in the field in 1994
- (15) and you had a chance to explain some of the photographs that
- (16) you or those with you took Did you have an opportunity to
- (17) determine whether oil could still be found at some of those
- (18) sites?
- (19) A Yes we did
- (20) Q Was part of your intent when you were out there to
- (21) determine what shape the oil was in what form it was in?
- (22) A Yes if I understand your question correctly by what shape
- (23) or what form it was in
- (24) Q How it was persisting?
- (25) A Yes Actually our focus of what we did in '94 was to turn

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- (1) to sites where people had reported oil and try to determine
- (2) what kinds of conditions or what mechanisms were in place that
- (3) were preserving the oil on the shorelines
- (4) Q How many sites did you go to sir?
- (5) A Well depends on how you define a site and for what
- (6) purpose Approximately 40 to 45 sites
- (7) Q And how many did you find oil at?
- (8) A All those sites but I would say four we found oil
- (9) Q And did you bring with you today some of the examples of
- (10) the oiled residue that you found at those sites?
- (11) A Yes
- (12) Q If you could come down off the stand to your cooler sir
- (13) Did you bring four examples with you?
- (14) A Yes
- (15) Q And if you could take those out one at a time and explain
- (16) what those are to us?
- (17) A Can I put these up?
- (18) Q Why don't you take it up Face the jury and explain them
- (19) one by one?
- (20) A I'll take these out first Not able to bring my pocket
- (21) knife into the courtroom
- (22) Q Why don't you go ahead and explain the other three are and
- (23) I'll get this ready
- (24) A This sample is a sample of the water surface that was
- (25) illustrated in one of the photographs that we prepared earlier

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- (1) and that you've looked at earlier. It was collected from a pit
 (2) that we dug in Point Helen. But the lid is loose if you wish
 (3) to pick it up and inspect it.
 (4) Q Is Point Helen in Prince William Sound?
 (5) A Yes, it's at the tip of Knight Island, approximately at
 (6) this location. In the photograph, the photograph was taken
 (7) awhile after this sample was collected.
 (8) Q If you could go on to the second, sir?
 (9) A This one was collected in Morning Cove.
 (10) MR NEAL: Could he speak up a little bit from back
 (11) here I can't hear.
 (12) BY MR JAMIN:
 (13) Q He's asked that you speak up.
 (14) A This next sample was taken at Morning Cove, located in the
 (15) Kenai Fjords, pretty difficult from this location, but this
 (16) location (indicating).
 (17) Q Let's get the numbers for the records that's circulating in
 (18) the jury. This is 6015, the first, and the second one is 6014?
 (19) A The larger jar that you're looking at now consists of
 (20) material that was removed from the boulder that we
 (21) photographed
 (22) earlier at Morning Cove, that boulder, and we came back six
 (23) days later. These pebbles are oiled pebbles that were
 (24) collected from storm berm on the outside of LaTouche, the
 (25) outside meaning the east side of LaTouche Island on the
 northeast end of LaTouche.

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- (1) Q Let me get that number, 6016.
 (2) Mr. O'Neill was able to get through security with his
 (3) keys. And the number on this one, Mr. Bush?
 (4) A Well, I have a sample number. I can't give you an exhibit
 (5) number. Do you want the sample number?
 (6) Q We're going to mark it as 6017. I think is the next one in
 (7) sequence?
 (8) A Would you like the sample number?
 (9) Q For identification, let's do that, sir?
 (10) A 94FB 01 S01.
 (11) Q Thank you. Can you explain where that came from?
 (12) A This sample was collected from the Foul Bay Location. It's
 (13) about in this location of this area of Kodiak Island.
 (14) Q Now, sir, I know that when you made reference before to the
 (15) photographs that you've described, you indicated that they
 (16) were
 (17) taken in 1994. Have these, the samples that you've shown to
 (18) the jury, are they from 1994?
 (19) A Yes, they are.
 (20) Q Excuse me a moment.
 (21) Let me ask you finally, sir. Has your team made an effort
 (22) to determine whether or not this is oil from the North Slope?
 (23) A Yes, we have.
 (24) Q And is it your opinion that this is oil from the Exxon
 (25) Valdez?
 A Yes, it is.

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- (1) Q Thank you. I'm not quite done. I wanted to make sure that
 (2) all the samples had come back.
 (3) THE COURT: While we're finishing that, I'm not sure
 (4) that I got the number of all the exhibits that you're dealing
 (5) with, 6014, 15, 16, and 17.
 (6) MR JAMIN: That's correct, Your Honor, and those are
 (7) the four oil samples.
 (8) THE COURT: Is there any objection to the admission of
 (9) those four exhibits?
 (10) MR NEAL: I'd like to ask about one of them, Your
 (11) Honor.
 (12) MR JAMIN: Which is that?
 (13) MR NEAL: The one you told me about this morning, I
 (14) don't know which number it is.
 (15) MR JAMIN: I'll move for the admission of all four
 (16) subject to Mr. Neal's examination. I just want to make sure we
 (17) get all four back here. Bear with me, Mr. Neal, I know you're
 (18) chafing at the bit.
 (19) MR NEAL: I got all day until 2:00, I guess.
 (20) BY MR JAMIN:
 (21) Q Mr. Bush, how did your team determine that this was oil
 (22) from the North Slope?
 (23) A There are a variety of ways that we look at that problem.
 (24) Aside from sheer analytical methodologies, when you return to
 (25) a site repeatedly from 1989, '92, '93, and '94, you're tracking

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- (1) the same material in time. And it's fairly straightforward
 (2) that if there aren't any major differences in appearance from
 (3) year to year, you're looking at the same material. In addition,
 (4) there are analytical methodologies we applied using different
 (5) techniques that we know it's Exxon Valdez oil. I don't know
 (6) that any one item is absolutely definitive and exclusive, but
 (7) the collective weight of all the evidence is very convincing.
 (8) Q Is one of the techniques that you use or your team uses a
 (9) chemical process called fingerprinting?
 (10) A Yes.
 (11) Q Were some of these samples fingerprinted as North Slope
 (12) crude?
 (13) A Yes, they were.
 (14) MR JAMIN: Mr. Neal.
 (15) CROSS EXAMINATION OF JAMES BUSH
 (16) BY MR NEAL:
 (17) Q Picking up right there - is it Dr. Bush or Mr. Bush?
 (18) A It is Mr. Bush.
 (19) Q Picking up right there, I have heard, and I'll just ask you
 (20) to confirm. If there had never been the grounding of the Exxon
 (21) Valdez and the oil spill, there would have been oil in Prince
 (22) William Sound?
 (23) A Are you going to quantify that in terms of amount or any -
 (24) Q I mean it just exists, doesn't it?
 (25) A As itself, crude oil specifically?

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- (1) Q Yes
 (2) A Yes it does
 (3) Q And that's the reason that you would have to go through
 (4) this process because there is oil out there that may very well
 (5) not be Exxon Valdez oil so you went through this process
 (6) fairly enough with these samples?
 (7) A Which process are you referring to?
 (8) Q The process you just described the finger printing and so
 (9) forth?
 (10) A The finger printing is used principally to be more specific
 (11) about which crude it is The observational process is specific
 (12) to the event
 (13) Q Well let me ask you about that What you determined was
 (14) that this is - that these samples here I gather if I'm
 (15) wrong correct me because I guess I was coming up here and I
 (16) didn't quite hear it all I gathered that you determined that
 (17) this was North Slope crude?
 (18) A That's correct
 (19) Q Not Exxon Valdez oil from your process you went through?
 (20) A Not precisely correct approximately
 (21) Q Let's be precisely It was my understanding that you
 (22) determined it was North Slope?
 (23) A The finger printing methodology determine it was North
 (24) Slope The observational methodology is much more
 (25) convincing
 (25) because of the time frame and the level of concentration in

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- (1) these sediments is much more convincing that it's Exxon Valdez
 (2) crude
 (3) Q That's not a scientific process that's your observations
 (4) you've been there in '89 '92 '94 et cetera right?
 (5) A No I would disagree The science of geology is very
 (6) observational and there are strict observation methods that we
 (7) follow to help make these determinations and I would say
 (8) that's a scientific process
 (9) Q Am I mistaken that you were unable to determine whether
 (10) one of these was North Slope crude or whether one of these was
 (11) questionable whether it came from the Exxon Valdez?
 (12) A Yes One of the samples the pebbles that were in the
 (13) Ziplock bag that was passed around the analytical results for
 (14) those samples eliminated a number of possibilities plant
 (15) material diesel fuel that sort of thing but because of the
 (16) state of weathering on the pebbles it's difficult to say with
 (17) certainty whether or not the material on them was weathered
 (18) tar motor oil or crude oil
 (19) Q In regard to there being oil in Prince William Sound
 (20) whether there had been a spill or not does some of that just
 (21) seep up through the ground or come in from other portions
 (22) places in Alaska?
 (23) A There has been work documenting and interpreting a large
 (24) amount of data that suggests that oil seeps outside of Prince
 (25) William Sound do contribute very minute amounts of oil on

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- (1) particular matter which moves along with the Alaska coastal
 (2) current and up into the Sound in very low concentrations and
 (3) very small amounts that's correct
 (4) Q And seeps up through the ground am I correct about that?
 (5) A Within the Sound?
 (6) Q Yes
 (7) A Not to my knowledge
 (8) Q But comes into the Sound from other sources?
 (9) A That's correct
 (10) Q And as a matter of fact oil can get in Prince William
 (11) Sound from events such as earthquakes can't it earthquakes
 (12) rupturing tanks you know what I'm talking about?
 (13) A I thought you meant through a natural event seeping up
 (14) through a fracture or crevasse that doesn't happen
 (15) THE COURT Have you not heard of the Katalla area
 (16) THE WITNESS Yes I have we discussed the Katalla
 (17) We discussed that with the movement throughout the Sound
 (18) that's the theory it gets on small particulate matters and
 (19) moves with the coastal currents You're referring to the
 (20) rupture tanks of the Valdez
 (21) BY MR NEAL
 (22) Q You made a map and showed oil in something called Sawmill
 (23) Bay do you remember that?
 (24) A I probably did I don't recall specifically which
 (25) illustration you're talking about

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- (1) Q I can show you if you wish but that would involve a
 (2) hatchery that was boomed and it turned out that the oil that
 (3) you showed as being oil or somebody showed I'm not sure
 (4) you
 (4) did it but in one of your composite maps you showed oiling
 (5) areas you showed oil I picked it up on your composite map as
 (6) oiled from the Exxon Valdez and it turned out that it was oil
 (7) that came from tanks ruptured during the 1964 earthquake
 (8) that's true isn't it?
 (9) A I'm not familiar with the specific exam I'm familiar that
 (10) Sawmill Bay had been boomed and we observed oily materials
 (11) outside the boom
 (12) Q Didn't you show oil on the beach inside Sawmill Bay and
 (13) wasn't it determined - we can get to this later if you want
 (14) to but you're not aware that that was determined to be oil
 (15) coming from tanks ruptured during the 1964 earthquake?
 (16) A No that's not correct I'm aware that oil in the Sound
 (17) has been identified tarry residues specifically that are
 (18) associated with that event What I'm not aware of is the
 (19) amount of material you're referring to oiled shoreline that
 (20) occurs within Sawmill Bay
 (21) Q You're not aware that there was allegedly oiled shoreline
 (22) in Sawmill Bay?
 (23) A That's what I'm confused about
 (24) Q We'll get to that You're not aware one way or the other
 (25) the question I'm asking right now?

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- (1) A I m aware of the issue of the 64 earthquake and the tar
 (2) released as a result of that event
 (3) Q You re not aware of what I m talking about the oiled
 (4) shoreline in Sawmill Bay being imputed to the Exxon Valdez
 (5) spill but later being determined to have come from tanks
 (6) ruptured in the 1964 earthquake?
 (7) A That s correct
 (8) Q You re not familiar with that?
 (9) A That s correct
 (10) Q You talked about - by the way the one that you could not
 (11) determine as Exxon Valdez oil or North Slope oil could you
 (12) give me the exhibit number on that? Do we have the exhibit
 (13) number? I don t know the exhibit number offhand It s the
 (14) ziplock bag
 (15) Well let s don t take the jury s time now if we could do
 (16) that later You will help me find that later and identify the
 (17) exhibit number?
 (18) A Certainly be happy to
 (19) Q Now you talked about dissolving oil in the water and I
 (20) believe you said very little oil dissolves in water?
 (21) A In a relative sense a small portion of the slick actually
 (22) dissolved correct
 (23) Q A lot of it is eaten by bacteria?
 (24) A Beg pardon? Well in time
 (25) Q A lot of it is flushed out into the ocean?

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- (1) A A portion of it is that s correct
 (2) Q By the way you re aware that Prince William Sound
 (3) completely flushes out every two or three weeks are you not?
 (4) A That statistic refers to broad general areas and broad
 (5) current flow There are a number of bays in isolated areas
 (6) that do not flush regularly and are not dominated by the
 (7) currents that you re referring to so as a general statement
 (8) for a large body of water and water within the Sound is
 (9) correct On a specific basis there are many exceptions to it
 (10) Q There s one picture you showed here Plaintiffs Exhibit
 (11) 245 48 that had the allegation of oil flowing off the beach do
 (12) you remember that?
 (13) A Yes
 (14) Q Do you see that?
 (15) A Yes
 (16) Q I m a little confused and I certainly want to clear this up
 (17) while I m on it Some pictures you took and brought in here
 (18) were taken in 1994?
 (19) A That s correct
 (20) Q This is not one of them is it?
 (21) A That s correct
 (22) Q This is taken when?
 (23) A In 1989
 (24) Q About the time of the spill?
 (25) A That s correct

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- (1) Q And you didn t want to leave - I m sure that nobody wanted
 (2) to leave the impression that this was one of the pictures taken
 (3) in 1994?
 (4) A Absolutely not I know of no case -
 (5) Q I m not suggesting you would but I thought that ought to
 (6) be brought out
 (7) Now you said that oil because of the energy of wave motion
 (8) and so forth sometimes recycles back into the environment
 (9) Well when it s on the beach it s in the environment I
 (10) gather?
 (11) A The discussion was referring to the aqueous environment
 (12) that is correct
 (13) Q And some of it is taken back out to the ocean again is it
 (14) not?
 (15) A That s correct
 (16) Q Or taken not again but goes back out into the ocean?
 (17) A Both statements are true that s correct
 (18) Q I think we went - you went through a chart here
 (19) demonstrating about the percolation of oil that had been
 (20) deposited on the beach do you remember that?
 (21) A Yes
 (22) Q And you said I believe you said that wouldn t happen if it
 (23) were bedrock?
 (24) A It would not same to the same degree that s correct
 (25) Q To a much lesser degree?

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- (1) A Yeah with the exception of the porosity within the rock
 (2) itself and fractures and crevices and things like that
 (3) Q Do you have at your fingertips how much of Prince William
 (4) Sound beaches is in fact bedrock?
 (5) A Not at my fingertips We have that on our GIS system and
 (6) we use our computer system to do that it is a difficult
 (7) question to address because not only is it difficult to define
 (8) what you mean by Prince William Sound but because of
 (9) heterogeneity shorelines areas that had been mapped and
 (10) classified and classified as one shoreline type are in fact
 (11) multiple shoreline types
 (12) Q Would you think or have any reason to disagree that
 (13) approximately 56 6 percent of the shoreline of Prince William
 (14) Sound is sheltered bedrock?
 (15) A Sheltered bedrock?
 (16) Q Yeah
 (17) A Seems a little high for sheltered bedrock although the
 (18) data are so imprecise that and the definition is imprecise
 (19) that it s difficult to say with certainty Clearly I believe
 (20) that a high percentage of the shorelines are bedrock dominated
 (21) and a substantial portion of those are in sheltered or semi
 (22) protected environments
 (23) Q As a matter of fact would you - what do you say about the
 (24) proposition that some 74 percent of shoreline of Prince William
 (25) Sound is bedrock whether sheltered or not and that 56 percent

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- (1) of that is sheltered bedrock?
 (2) A If I had the opportunity to review the data and review the
 (3) source of the data I would be happy to confirm or disagree
 (4) with that
 (5) Q You don't have that at your fingertips?
 (6) A I do not have it at my fingertips
 (7) Q Would you agree with me that well over a majority of the
 (8) shoreline of Prince William Sound is bedrock?
 (9) A Well I don't know over a majority but certainly a
 (10) substantial portion is
 (11) Q When you're talking about event of oil or oil spill on
 (12) beaches would you agree that and I think you said that one of
 (13) the elements to consider is exposure versus sheltered beach
 (14) right?
 (15) A That's correct
 (16) Q And I think you said or intended to say that if it's a
 (17) sheltered beach there is less possibility of damage?
 (18) A If it's a sheltered beach when you say damage you mean
 (19) oil impact or do you mean -
 (20) Q Yeah less impact
 (21) A For a sheltered environment the opposite is the case The
 (22) oil tends to persist there longer
 (23) Q So an exposure - exposed has less tendency to remain or
 (24) persist?
 (25) A That's correct

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- (1) Q Mr. Bush you went out to - I think one of the points you
 (2) make here or came to make was that there still is oil in Prince
 (3) William Sound?
 (4) A That is correct
 (5) Q And you do that through your statement that there is some
 (6) oil persisting in Prince William Sound that is all from the
 (7) Exxon Valdez?
 (8) A That is correct
 (9) Q Now you went to certain spots in Prince William Sound in
 (10) 1989 did you not?
 (11) A Yes
 (12) Q And indeed at some of these spots it was just eyeballing
 (13) and some of them it was really some where you to use your
 (14) term you did some transecting?
 (15) A That's correct
 (16) Q And I take that to mean you went to the intertidal basin
 (17) that this Dr. Peterson entertained us so long yesterday
 (18) about - were you here?
 (19) A As well as other locations yes
 (20) Q By the way other than and I don't want to you think I'm
 (21) quarreling with you on this but it's one of my jobs here
 (22) prior to the Exxon Valdez - work you've done on the Exxon
 (23) Valdez did you ever participate in an intertidal survey?
 (24) A Prior to the Exxon Valdez work?
 (25) Q Yes

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- (1) A I don't recall the precise dates I believe some of the
 (2) work I did for AtoChem North America (ph) was prior to the
 (3) Exxon Valdez but I'm not positive
 (4) Q You're not positive?
 (5) A In fact some of the work we did for the EPA regarding the
 (6) refineries may have been pre Valdez I don't recall precisely
 (7) the dates of the projects
 (8) Q Now you went to some of these spots in 1989 and did what
 (9) you call transecting?
 (10) A That's correct
 (11) Q And I take that to mean I've read your work to indicate
 (12) that that is you actually dig down you actually go down lay
 (13) out a grid of some sort in the intertidal zone and you take
 (14) samples?
 (15) A Yes and more but that is part of what we do yes
 (16) Q And you do more And you also determine at that time
 (17) whether there is oil and what should I say the degree of
 (18) oiling?
 (19) A Yes
 (20) Q And then you went back to many of these spots in 1992 to
 (21) have another look?
 (22) A Yes
 (23) Q I guess you didn't transect again but you had another look?
 (24) A No in 1992 we had three components of our field program
 (25) We returned to the transect sites and retransected in our

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- (1) current nomenclature retransected those sites We did an
 (2) area wide sampling program in which we did visit a larger
 (3) number of sites approximately 70 and examined what we
 (4) thought
 (5) to be known occurrences of oil or unusual histories in
 (6) documents that have indicated shoreline recovery and
 (7) anything
 (8) unusual in the shoreline recovery history
 (9) We also conducted what we referred to -
 (10) Q All I asked you was did you transect again or did you -
 (11) A I thought you asked what we did
 (12) Q Well I don't want to cut you off but I do have some
 (13) things I want to ask and maybe we can move along
 (14) A Certainly
 (15) Q In 1989 in these transects you determined whether there
 (16) is oil deposited or oil there and you determined the degree of
 (17) oiling is that fair?
 (18) A That's approximately correct
 (19) Q That's part of what you did?
 (20) A Yes
 (21) Q And then when you went back in 1992 you determined if
 (22) there
 (23) was oil there and the degree of oiling right?
 (24) A Yes
 (25) Q And when you went back in 1994 as part of your work you
 (26) did the same thing didn't you?
 (27) A 1994 not exactly We did not visit the transect sites
 (28) with equipment and with an investigative team at the same level

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- (1) of detail as we did in the previous field programs in 94 it
 (2) was a much more rapid survey
 (3) Q Much more rapid?
 (4) A Yes
 (5) Q How long were you there in 94?
 (6) A Approximately eight to ten days Nine days I believe
 (7) Q But you according to your deposition did reach some
 (8) determinations about the degree of oiling even in 1994?
 (9) A That s correct
 (10) Q Now let me go through some of those and some of them
 (11) you ve mentioned here Let s take I m not sure I m going to
 (12) pronounce this right Eshamy?
 (13) A Eshamy
 (14) Q You put up an exhibit 4020 that talked about Eshamy Bay?
 (15) A That s correct
 (16) Q You went to Eshamy Bay in 1989 and according to your work
 (17) you found that there was a moderate oiling?
 (18) A That is correct to my recollection I believe it was
 (19) moderately oiled
 (20) Q I ll be happy to show you - if you don t have a
 (21) recollection I think I can refresh you
 (22) A I think that s right
 (23) Q And when you went back in 1992 you found that that
 (24) moderate had changed to light?
 (25) A That s correct

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- (1) Q You also talked about Morning Cove and that was your
 (2) Exhibit 6020 Could we have that? Morning Cove is - I have
 (3) it down here as 6022
 (4) MR JAMIN Eshamy Bay is 6020
 (5) MR NEAL Is this 6022?
 (6) BY MR NEAL
 (7) Q This is Morning Cove?
 (8) A That s correct
 (9) Q Now when you went there in 1989 you said that the oil -
 (10) there was heavy oiling correct?
 (11) A That s correct
 (12) Q When you went back there in 1992 however you described
 (13) the oiling as light?
 (14) A That is correct
 (15) Q With respect to Point Helen do you remember that that s
 (16) an exhibit you brought out 6025?
 (17) A Yes
 (18) Q You went there in 1989?
 (19) A Yes
 (20) Q And you said the oiling was heavy?
 (21) A That is correct
 (22) Q When you went back in 1992 you determined that the oiling
 (23) had changed to moderate?
 (24) A I believe that s correct yes
 (25) Q And when you went back in 1994 you could find practically

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- (1) no oil or little oil?
 (2) A That is not correct
 (3) Q Not correct okay Did you find very little surface oiling
 (4) and improvement in subsurface maybe that s the way to say it?
 (5) A Difficult to quantify the improvement at subsurface but
 (6) the surface is definitely cleaner that s correct
 (7) Q So it went from heavy to moderate to even improvement from
 (8) moderate?
 (9) A Yes
 (10) Q In 1989 you went to East LaTouche Island?
 (11) A Yes
 (12) Q And there in 89 you determined there was light degree of
 (13) oiling?
 (14) A I believe that s correct
 (15) Q In 92 that changed to very light?
 (16) A Yes
 (17) Q And in 1994 you reported quote practically no visible
 (18) oil?
 (19) A I believe there was no visible evidence of oil that s
 (20) correct
 (21) Q Maybe you re right I ll read it I think we observed
 (22) practically no visible oil Okay?
 (23) A Okay
 (24) Q So that had changed then from light to very light to we
 (25) observed practically no visible oil?

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- (1) A That s correct
 (2) Q There were others I gather that have the same improvement
 (3) Without me going through all of them would you agree that s a
 (4) fair statement - or had improvement I won t say the same?
 (5) A Yes that is true
 (6) Q I won t go through all of those Improved from 89 to 92
 (7) and from 92 to 94?
 (8) A Yes that s correct
 (9) Q In that regard in picking out these places where you made
 (10) your transects how did you determine where to go to make
 (11) them?
 (12) A Well there were a number of things that we did to
 (13) determine the location of transects We flew reconnaissance
 (14) flights for approximately three days and this is in 1989 we re
 (15) talking about We flew reconnaissance flights over the area to
 (16) identify areas of client lands We were retained by Chugach
 (17) Corporation and their respective native villages to inspect
 (18) these lands and we flew them with aircraft fixed wing wheel
 (19) craft well float too and examined them in 1989 to identify
 (20) major areas large areas that had been impacted And then we
 (21) returned to those general areas in vessel shortly thereafter
 (22) and did a more detailed or closer reconnaissance to the areas
 (23) after which we selected particular more narrow selections of
 (24) shoreline to investigate and then we departed from the major
 (25) vessel on a small skiff and selected the specific transect
 sites

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- (1) Prior to doing this we examined oiling maps that were
 (2) released I believe - I don't recall now if they were released
 (3) by the Alaska Department of Environmental Conservation or if
 (4) they were released by Exxon the oiling maps of the area to try
 (5) to gain some idea where the oil was We gathered some
 (6) additional anecdotal information and we inquired of the clients
 (7) themselves if they had areas of sites of particular interest
 (8) archeological sites cultural sites that they wanted us to be
 (9) sure and investigate for any particular reason I believe that
 (10) comprises the process
 (11) Q In the main - and in order to do your work is it fair to
 (12) say that in the main you looked for places that were oiled to
 (13) see what was happening?
 (14) A It's fair to say that we were there to investigate oil
 (15) sites and by virtue of that we tried to identify where oil
 (16) was yes
 (17) MR NEAL I just want at this point may it please
 (18) the Court exhibits that I've been asked to offer into
 (19) evidence I think there is no controversy about this May it
 (20) please the Court we offer into evidence Exhibits 2695 2697
 (21) 2719 through 2728 through 2728 2731 2763 through 2765
 (22) 2775 9209 9223 9224 9227
 (23) (Exhibits 2695 2697 2719 through 2728 2731 2763 through
 (24) 2765 2775 9209 9223 9224 9227 offered)
 (25) MR O NEILL We have no objection to those exhibits

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- (1) THE COURT These are all defendants exhibits?
 (2) MR O NEILL Yes sir they are
 (3) THE COURT Admitted without objection
 (4) (Exhibits 2695 2697 2719 through 2728 2731 2763 through
 (5) 2765 2775 9209 9223 9224 9227 received)
 (6) MR NEAL Thank you Mr Bush Excuse me just a
 (7) moment Thank you Mr Bush
 (8) MR JAMIN First I offered 6014 to 6017 I didn't
 (9) hear objection to it
 (10) THE COURT We didn't resolve the package of the
 (11) ziplock bag of rocks
 (12) MR NEAL I only object to one of them and I don't
 (13) know which one to attach that objection
 (14) REDIRECT EXAMINATION OF JAMES G BUSH
 (15) BY MR JAMIN
 (16) Q The bag of ziplock rocks is 6016 and let me go ahead and
 (17) ask you a couple more questions about that
 (18) First of all sir is this the one the fingerprinting
 (19) analysis could assure it was from the North Slope?
 (20) A That's correct
 (21) Q And is that in part because the analysis indicated it was
 (22) particularly weathered material?
 (23) A That's correct
 (24) Q Were there other indicators that led you to believe that it
 (25) was North Slope crude and specifically from the Exxon Valdez?

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- (1) A Yes
 (2) Q What were they?
 (3) A We obtained this sample from the same location that we
 (4) sampled and visited previously and we have a history a
 (5) photographic so to speak or a visual history of contamination
 (6) in that area
 (7) In addition to that there had been substantial treatment
 (8) activities on that beach which indicated that the area had
 (9) been oiled in the past
 (10) Q And when you say treatment you mean part of the cleanup
 of
 (11) the oil spill?
 (12) A Yes
 (13) MR JAMIN Move for the admission of 6014 to 6017
 (14) (Exhibits 6014 6015 6016 and 6017 offered)
 (15) THE COURT With respect to the bag of rocks was the
 (16) chemical fingerprinting ever done of that area where those
 (17) particular rocks were picked up?
 (18) THE WITNESS The fingerprinting was not done from the
 (19) specific location the sample was collected
 (20) BY MR JAMIN
 (21) Q Was it done from areas near by?
 (22) A Yes it was
 (23) THE COURT I'll allow 6014 6015 6016 and 6017
 (24) (Exhibits 6014 6015 6016 and 6017 received)
 (25) MR JAMIN Thank you

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- (1) BY MR JAMIN
 (2) Q Mr Bush I just have one other question Mr Neal was
 (3) discussing with you how the oil would go out into the water
 (4) from certain beaches over time and when this - as part of the
 (5) cleaning process When the oil is released from the beach are
 (6) you able to see that?
 (7) A In what context? Do you mean can we see the process that
 (8) takes place?
 (9) Q Yes
 (10) A Or can we see the oil specifically?
 (11) Q Let's ask first can you see the process?
 (12) A Yes you can see the process
 (13) Q How do you see it?
 (14) A It's wave action and agitation on the beaches in the
 (15) immediate sense In a longer term sense by measuring
 (16) transects and I probably should take a moment to explain how
 (17) that's done
 (18) Q Sure
 (19) A The transects that we've installed on these sites are an
 (20) exercise in measuring the contour of the beach You place a
 (21) stake in the upland area out of the intertidal zone and
 (22) horizontal it down stair step our way down the face of the
 (23) beach By comparing the shape of the beach from year to year
 (24) season to season one can determine change in the beach To
 (25) the extent that a subsequent profile is higher materials of an

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(25) MR SCHROER We now call Les Meredith

- (1) earlier date have been buried at some point in their history
 (2) To the extent the profile is lower they have been eroded
 (3) away So by returning to this repeatedly one can gain a sense
 (4) as to what kind of wave action or what kind of erosion natural
 (5) action or deposition has taken place along that profile So
 (6) for a longer term perspective on whether or not the material is
 (7) present or has been removed one can compare profiles that is
 (8) the cross section of the beach along the same transect over
 (9) time In a short time perspective one simply watches the
 (10) storm events and returns to the site
 (11) Q And as the beach goes from heavily oiled to moderately or
 (12) from moderately to lightly and the beach is losing some of its
 (13) oil where is that oil going?
 (14) A There are a variety of locations The oil can move farther
 (15) up on the beach subtidally below the zone laterally move out
 (16) as floating or suspended particulate matter and recur on a
 (17) subsequent shoreline later or out into the open ocean and float
 (18) out into the Pacific Depends on the current waves and
 (19) particular situation
 (20) MR JAMIN Thank you very much sir
 (21) THE COURT Thank you sir You may step down Call
 (22) your next witness
 (23) MR SCHROER Plaintiffs call Les Meredith
 (24) THE WITNESS Your Honor should I leave these here?
 (25) THE COURT You can have the cooler but not the

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- (1) things that were in it
 (2) MR LYNCH Your Honor before Mr Meredith testifies
 (3) by agreement of Mr O Neill we have a group of DXs we would
 (4) like to offer and which I understand there is no objection
 (5) MR LYNCH Mrs Robinson has worked that arrangement
 (6) out
 (7) MS ROBINSON Marianne Robinson on behalf of Exxon
 (8) We have additional preadmitted exhibits DX425 DX966
 DX1904
 (9) DX5239 A DX5241 A DX5242 A DX5587 DX5644 A
 DX5665 A
 (10) DX5836 DX5839 DX5842 DX6763 A DX7156 DX9158 A
 DX9159
 (11) DX9160 DX9161 DX9162 DX9163 DX9164 DX9166 A
 DX9169
 (12) DX9271 and DX9272
 (13) (Exhibit DX425 DX966 DX1904 DX5239 A DX5241 A
 (14) DX5242 A DX5587 DX5644 A DX5665 A DX5836 DX5839
 DX5842
 (15) DX6763 A DX7156 DX9158 A DX9159 DX9160 DX9161
 DX9162
 (16) DX9163 DX9164 DX9166 A DX9169 DX9271 and DX9272
 offered)
 (17) MR O NEILL We have no objection to any of those
 (18) Judge
 (19) THE COURT Those defendants exhibits are admitted at
 (20) this time without objection
 (21) (Exhibit DX425 DX966 DX1904 DX5239 A DX5241 A
 (22) DX5242 A DX5587 DX5644 A DX5665 A DX5836 DX5839
 DX5842
 (23) DX6763 A DX7156 DX9158 A DX9159 DX9160 DX9161
 DX9162
 (24) DX9163 DX9164 DX9166 A DX9169 DX9271 and DX9272
 received)

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- (1) THE CLERK Raise your right hand
 (2) (The Witness Is Sworn)
 (3) THE CLERK Please be seated For the record sir
 (4) state your full name your address and spell your last name
 (5) THE WITNESS My name is Les R Meredith
 (6) M e r e d i t h I live at 10423 Marine View Drive Mulkitteo
 (7) Washington
 (8) DIRECT EXAMINATION OF LES R MEREDITH
 (9) BY MR SCHROER
 (10) Q Mr Meredith what do you do for a living?
 (11) A I m a commercial fishermen in the Upper Cook Inlet
 (12) Q Do you have any other jobs?
 (13) A I also teach high school biology at Noterdale High School
 (14) in Lynchwood Washington
 (15) Q How long are you sir?
 (16) A I m 53
 (17) Q Do you have a family?
 (18) A Yes sir My wife Colleen and two daughters Michelle is
 (19) 24 and Lori is 21
 (20) Q How long have you been a commercial fisherman?
 (21) A I started commercial fishing in 1972
 (22) Q Was that in Alaska?
 (23) A No sir that was in Washington state
 (24) Q When did you first become a commercial fisherman in
 Alaska?
 (25) A I purchased a limited entry permit in the winter of 1982

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- (1) and was able to fish it for the first time in 1983
 (2) Q Let s take just a minute to talk about your purchase of
 (3) that A limited entry permit could you just tell the jury
 (4) what that is generally?
 (5) A It is a document that gives us the right to fish in a
 (6) designated area within the State of Alaska and there are a
 (7) limited number of those permits
 (8) Q And apart from buying a permit do you need other things in
 (9) order to be able to fish commercially?
 (10) A To be a drift gillnetter you need a boat and at the same
 (11) time I purchased a boat and the equipment that go along with
 (12) it
 (13) Q And I take it you need some nets and other equipment to go
 (14) along with that?
 (15) A That is correct
 (16) Q How big an investment did you have to make to become a
 (17) fisherman in Upper Cook Inlet?
 (18) A Somewhere between 100 and 105 thousand dollars into the
 (19) operation
 (20) Q Now did you at that time have that amount of money in the
 (21) bank to pay cash?
 (22) A No sir I did not
 (23) Q Where did you get the money?
 (24) A I was able to obtain a second mortgage on my residence I
 (25) owned a commercial fishing boat in Washington free and clear

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- (1) I remortgaged that We owned some private recreational
 (2) property and I mortgaged that and that became the collateral
 (3) for the loan
 (4) Q Out of the you said 105 000 how much did you have to
 (5) pay - how much did you borrow?
 (6) A 95 000
 (7) Q We ve just had drawn up on a screen a exhibit that s been
 (8) preadmitted Exhibit 304 Can you tell us what that
 (9) represents?
 (10) A This is an indication that s referred to as the Upper Cook
 (11) Inlet drift area and this is the area I commercial fish
 (12) Q And just in terms of our orientation this is Cook Inlet
 (13) right?
 (14) A That is correct
 (15) Q And toward the upper right hand part of that map that s
 (16) where Anchorage would be?
 (17) A That s correct
 (18) Q And then down in the bottom in the center that s where
 (19) Homer would be?
 (20) A That is also correct
 (21) Q Are there are boundary lines in Upper Cook Inlet that tell
 (22) you where you can fish and where you can t fish?
 (23) A On the map you can see there is a line drawn across about
 (24) mid screen and that s referred to as the forelands and that
 (25) is the north end of our area and at the lower part of the

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- (1) screen you can see possibly it says Anchor Point and that is
 (2) called the Anchor Point line and that is a latitude line that
 (3) is the south end
 (4) Q Have you fished in this area every year except 1983?
 (5) A With the exception of 1989
 (6) Q Let s talk about fishing in Upper Cook Inlet Is there a
 (7) typical time of year when you re permitted to fish?
 (8) A To the best of my recollection we open at the first Monday
 (9) or Friday that follows the 25th of June
 (10) Q How long does the season stay open in Upper Cook Inlet?
 (11) A For all intents and purposes it ends the first week in
 (12) August The season is not officially closed but the fish are
 (13) basically gone at that time
 (14) Q Within the season do you fish every day?
 (15) A No sir We begin the season usually with a Monday and
 (16) Friday opening As the season progresses depending upon
 the
 (17) strength of the run decisions that are made by Alaska Fish &
 (18) Game we may get additional time It s not uncommon for us to
 (19) get a Wednesday within two to three weeks of the start and
 (20) then later in July sometimes we ll get additional time
 (21) Q When you do get an opener do you fish 24 hours in a whole
 (22) day?
 (23) A No sir The time frame within Cook Inlet is 7 00 in the
 (24) morning until 7 00 at night
 (25) Q You indicated that the season generally starts about the

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- (1) end of June?
 (2) **A** That s correct
 (3) **Q** Did you make any preparations before the fishing season
 (4) starts?
 (5) **A** My boat is winterized and dry docked at Wards Cove Packing
 (6) in Kenai and we try to get up here as soon as possible to
 (7) begin the reverse process of making sure that everything from
 (8) the year before is still operational we don t have stuck
 (9) valves the steering still steers and the throttle still
 (10) throttles and things turn and wiggle the way they are supposed
 (11) to
 (12) **Q** In a typical year assuming the season is going to start
 (13) shortly after the 25th when do you leave Washington to come
 (14) up
 (15) to Alaska?
 (16) **A** I teach school as I said in the Edmonds school district
 (17) and it s not uncommon for me to have a plane ticket for 5 00 on
 (18) the afternoon that school closes
 (19) **Q** Now let s talk about a typical fishing day We ve had
 (20) prepared a video that shows some of your operation?
 (21) **A** That is correct
 (22) **Q** At this time with the Court s permission I would like to
 (23) play preadmitted Exhibit 270 a video of Mr Meredith s
 (24) operation and as this is playing would you just look at the
 (25) screen next to you and describe to the jury in the about
 (26) 4 and a half minutes what s going on?

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- (1) **A** Yes sir I will This is 3 30 in the morning on July
 (2) 16th 1990 We are leaving the Kenai River in route to our
 (3) fishing grounds Legal fishing begins at 7 00 It is not
 (4) uncommon for us to be out this area - welcome to Cook Inlet
 (5) It s not uncommon for us to be out this early looking for sign
 (6) that fish are present
 (7) 7 00 Alaska Fish & Game allows us to put the equipment in
 (8) the water at seven This large roller that you see next to me
 (9) is called a power reel it helps to pull the net off of the
 (10) reel The large drum that you see there in the foreground is
 (11) indeed a hydraulic drum that we wind the net on It s 900 feet
 (12) long
 (13) I m looking at this time to see if we ve got a clear shot
 (14) I m hoping that no one is blocking me off Sometimes speed
 (15) the
 (16) boat up slow it down so it doesn t backlash and here is our
 (17) first evidence that we have picked a place that there seems to
 (18) be red salmon at this point As a commercial fisherman that s
 (19) a very exciting site and those are splashers here Breakfast
 (20) in a cup that was breakfast and you can see there is fish in
 (21) the net I m now communicating with other friends of mine that
 (22) we have a fishing group to find out if I m in the place or if
 (23) they are in the place
 (24) I m now releasing the net probably going to the other end
 (25) probably because of a change in wind or tide So I m reversing
 (26) the end that I connect the boat to

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- (1) This is 8 10 in the morning We re now going to begin to
 (2) pick the net This the my daughter Lori who is my crew
 (3) member try to swing the fish over the net and hang below the
 (4) net so they are hanging by their gills and try to clear the
 (5) net as rapidly as possible The net only makes money when it s
 (6) in the water And we re clearing the fish as quickly as
 (7) possible They have a real affinity for getting themselves
 (8) tangled up See I spin it over and try to drop it in This
 (9) is a shot underneath the reel This is a shot into the hold as
 (10) the fish are going in there
 (11) I have probably got a call from somebody else that says
 (12) somewhere else is a little better This shot here is 3 00 in
 (13) the afternoon The weather improved Love to see it that way
 (14) every day little editorial But 3 00 in the afternoon very
 (15) clear nice day Very near the mouth of the Kenai River The
 (16) move was advantageous I had gotten word from my friends
 (17) that
 (18) they were - I m eating again You can actually sometimes you
 (19) can actually feel the fish hit the net if I m hanging on to the
 (20) lead line there
 (21) Now I m setting up probably to pick this up Yes I am
 (22) it s late in the afternoon As a matter of fact it s 6 30
 (23) The net all the gear has to be on the boat by 7 00 You re
 (24) liable for a very severe fine if you did not have all the gear
 (25) and equipment on the boat The fish do not necessarily have to
 (26) be out of the net but there can be no fishing equipment in the

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- (1) water after 7 00
 (2) More fish coming over and again you can see we try to
 (3) spin them out of there get them out of there as quickly as
 (4) possible If we re unable to get them clear of the net by
 (5) 7 00 at approximately ten minutes to seven I have a pedal in
 (6) the back that activities that big drum I just step on that
 (7) thing everything comes in in a big mess and we can worry
 (8) about cleaning it out later but I never have that thing out
 (9) after 7 00
 (10) This is returning to the mouth of the Kenai River This is
 (11) one of the other boats here This is the fleet returning Now
 (12) I have brailer bags these are those big bags and this is the
 (13) operator He s pulling the brailer bag out That s one of the
 (14) brailers in my boat They turn this upside down in this tote
 (15) bin and put a label that indicates it came from my boat and
 (16) each one of those brailers is dumped in there They will label
 (17) it and then it will go across the sorting table be weighed
 (18) electrically and the fish I caught that day will be credited to
 (19) my account
 (20) We were very lucky We are close to the river This is
 (21) only 10 40 20 minutes to 11 Not uncommon for us to be
 (22) returning at midnight 1 00 if we were way down in the lower
 (23) part of the inlet This particular day we were close to the
 (24) river
 (25) **Q** That was quick?

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- (1) A Yes it was
 (2) Q Let me ask you just a couple followups on what we just
 (3) saw First question what kind of fish were we looking at
 (4) there?
 (5) A These are primarily reds or sockeye salmon
 (6) Q Is that the predominant species that you catch in Upper
 (7) Cook Inlet?
 (8) A Yes it is
 (9) Q Now you mentioned in the course of that there was a point
 (10) where you said you were calling your friends on the radio?
 (11) A Yes
 (12) Q Do you fish in something called a fishing group?
 (13) A That s correct We have several people that have gone
 (14) together for mutual benefit The inlet is a very large area
 (15) and there are times that the fish will be congregated in one
 (16) area more than others and we spread out in the morning one of
 (17) us tries to find where they are If we do find them we call
 (18) the group in and for mutual benefit I might be the one today
 (19) it might be somebody else tomorrow
 (20) Q You have fished in Cook Inlet since 1983 and you just
 (21) described fishing with a group Of what you just saw on the
 (22) video would you say that s a fairly typical Upper Cook Inlet
 (23) drift operation?
 (24) A Very typical
 (25) Q Now you ve used the phrase drift gillnetting and I want to

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- (1) talk a little bit about the type There are other kinds of
 (2) fishing for salmon are there not?
 (3) A That s correct
 (4) Q And one of those is called setnetting?
 (5) A That is also correct
 (6) Q And you can also seine in areas?
 (7) A You can seine in the Lower Cook Inlet but it s not allowed
 (8) in Upper Cook Inlet
 (9) Q In a very general way would you describe for the jury s
 (10) benefit describe what you do drift gillnetting as compared to
 (11) setnetting and seine?
 (12) A When I drift the net it s a line a curtain that attaches
 (13) on the back of the boat and sets in the water And we drift
 (14) with the whims of the currents within the inlet We drift down
 (15) and the tide turns and we drift back
 (16) A setnet gillnet is one that s attached to the beach and an
 (17) individual owns a permit for a certain distance of that beach
 (18) and he s allowed to anchor nets to the bottom and they stay
 (19) fixed in one place They don t drift as ours do
 (20) Q Is one of the differences between you and a setnetter that
 (21) they stay close to the beach but your boat is allowed to roam
 (22) over the entire Upper Cook Inlet?
 (23) A That is correct
 (24) Q And you said you don t have seiners in Upper Cook Inlet?
 (25) A That s also correct

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- (1) Q Let s move onto 1989 You indicated that in a normal year
 (2) you made some preparations and came up shortly before the
 first
 (3) opener in late June?
 (4) A That s correct
 (5) Q Did you make any other preparations following the 1988
 (6) season and let s just say leading up to the oil spill which
 (7) I ll tell you was in late March of 89?
 (8) A At the end of the season of 1988 I contracted with a
 (9) Lindal Boat Company in Stanwood Washington to build a new
 37
 (10) by 12 gillnet boat that had over double the capacity of the
 (11) vessel that I had been fishing up through 1988 During the
 (12) winter of 1988 myself and an associate we if you will we
 (13) built the boat I bought it like an overgrown set of -
 (14) erector set and I put it together The Lindal Boat Company
 (15) supplied me with all the materials and then I put it together
 (16) Q When did you start working on your new boat?
 (17) A December 1st 1988
 (18) Q Did I understand you you did this physically with your own
 (19) hands?
 (20) A That is correct
 (21) Q You didn t hire a company to do this for you?
 (22) A Well I should qualify that There were certain things
 (23) that I was not capable of doing For example I don t know how
 (24) to especially bed an engine and align the shaft I don t know
 (25) how to do heavy fiberglass work for example mating the hull to

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- (1) the house I did not have enough expertise to do that
 (2) Q Were you teaching school during this period?
 (3) A Yes sir
 (4) Q When did you have time to work on building your boat?
 (5) A From 2 30 in the afternoon until 2 30 in the morning and
 (6) weekends
 (7) Q How much did your new boat cost you?
 (8) A I have 105 000 in cash in it If I were to have purchased
 (9) the boat from the company complete it would have cost me 130
 (10) plus
 (11) Q Now when you set out to build that new boat did you have
 (12) 105 000 in cash to pay for it?
 (13) A No Again what I had done is I had taken all of my
 (14) profits from the 1988 season and plowed them back into the
 (15) boat and then I again approached my cannery Wards Cove
 (16) Packing and asked them if they would back me for the
 remaining
 (17) part which they did
 (18) Q This may be an obvious question but if you were going to
 (19) put this kind of money in and borrow money were you
 expecting
 (20) a good fishing season in 1989?
 (21) A Yes The capacity of the boat that I had built had twice
 (22) the hauling capacity as the one that I had before
 (23) Q Now you talked about using some of your profits from 88
 (24) Did you have a good season in 88?
 (25) A Yes sir I did

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- (1) Q Do you recall about how much money you made from your
 (2) commercial fishing operation in Upper Cook Inlet in '88? And
 (3) by that I mean the amount of money your processor paid you for
 (4) your fish?
 (5) A I don't remember the exact dollar amount but it was very
 (6) close to 105 to 107 thousand dollars
 (7) Q Let me stop right there and ask for just a second about how
 (8) it is you make money as a fisherman We saw your video At
 (9) the end of the day you go to the processor or the cannery
 (10) right?
 (11) A That is correct
 (12) Q How do they go about deciding how much money they are
 (13) going
 (14) to pay you for your fish?
 (15) A When we arrive in Alaska or to our fishing area usually
 (16) the cannery has posted a starting price and that is posted
 (17) conspicuously around the area
 (18) Q Let me interrupt you I didn't ask a very good question
 (19) Does the processor pay you by the fish or pound or how
 (20) does that work?
 (21) A We are paid by the pound
 (22) Q And are you paid the same amount for every kind of fish you
 (23) might get?
 (24) A No sir
 (25) Q In addition to sockeye and red do you catch some other
 (26) species?

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- (1) A Very rarely I've caught a few silvers In the years that
 (2) I've been fishing probably eight king salmon and then we do
 (3) also catch a few chum salmon
 (4) Q So is it right to say that they pay you for the amount of
 (5) pounds you catch and they pay you at a certain per pound rate?
 (6) A That is correct
 (7) Q And it makes sense that if you catch fewer pounds your
 (8) income goes down?
 (9) A Yes
 (10) Q And if the price per pound goes down you also get less
 (11) income right?
 (12) A That is also correct
 (13) Q Now let's get back into 1989 You started building your
 (14) boat you said the first of December of 1988?
 (15) A That is correct
 (16) Q And let's move into the end of March of 1989 When did you
 (17) first hear about the oil spill?
 (18) A I was installing the control system in my boat and it was
 (19) not uncommon for us to have a portable radio in there to add a
 (20) little bit of company and we heard the first announcement that
 (21) there had been a grounding of a vessel in Prince William
 (22) Sound
 (23) Q Did that give you any immediate concern about your own
 (24) fishing?
 (25) A Actually it didn't because in my opinion Prince William
 (26) Sound was a long ways from where I was

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- (1) Q Did you then continue making your own preparations to fish
 (2) in Cook Inlet?
 (3) A Yes we continued to finish the boat
 (4) Q Did you make any inquiries of anybody up here to see
 (5) whether in fact there might be any effect on Upper Cook Inlet?
 (6) A I called the cannery the next morning as soon as I was at
 (7) work and I called the cannery the next morning and asked
 (8) them
 (9) what their opinion was and at that time their opinion
 (10) concurred with mine
 (11) Q Now did you then continue to work on your boat?
 (12) A Oh definitely
 (13) Q When did you finish it?
 (14) A It was finished by the first of April
 (15) Q Do the fishermen christen their boats?
 (16) A Yes sir they do
 (17) Q Do you like break a bottle of champagne on it?
 (18) A Yes we did
 (19) Q Do you name your boats?
 (20) A It's My Colleen
 (21) Q And your wife's name is Colleen is that a coincidence?
 (22) A It better be better be the right name
 (23) Q After you finished the boat right around the first of
 (24) April did you continue making plans to go up to Alaska?
 (25) A Let me clarify that first of April It went in the water
 (26) the first of April We christened it the first of April It

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- (1) wasn't done for at least another month after that It was in
 (2) the water but it still needed considerable amount of work
 (3) I'm sorry
 (4) Q And then my question is what I'm interested in is after
 (5) that time around the first of April leading up to the late
 (6) June period when you hoped to fish what did you do to keep
 (7) yourself apprised of anything of what was going on up here?
 (8) A I wouldn't say daily but I called our cannery at least
 (9) maybe once twice a week to see if they had any updates on
 (10) whether the oil spill in Prince William Sound was going to have
 (11) any effect on us in Cook Inlet
 (12) Q And what were you told?
 (13) A At the present time we were told to assume that the fishing
 (14) season would occur as scheduled
 (15) Q Did you then complete your preparations to come up to
 (16) Alaska?
 (17) A Yes sir
 (18) Q And when did you leave to come up to Alaska?
 (19) A If I'm not mistaken the end of school that year was around
 (20) the 17th or 18th of June possibly a day or two earlier and we
 (21) left that day
 (22) Q Now one thing we didn't talk about in connection with your
 (23) general fishing is who you fish with that is who is on your
 (24) boat Obviously you're on the boat In the video we saw at
 (25) least one other person?

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- (1) A Yes sir that s my daughter Lori
 (2) Q Does your daughter Lori serve as crew for you?
 (3) A Yes sir she does
 (4) Q Did you have crew lined up to work with you in 1989?
 (5) A In '89 in anticipation of a big year I hired an additional
 (6) crew member that year
 (7) Q So for your 1989 fishing it was going to be you as the
 (8) skipper and your daughter and then another crew person?
 (9) A That is correct
 (10) Q When did you get up to Alaska?
 (11) A Again I m not sure of the exact date but I do know that I
 (12) was here before the first scheduled opening We came in in
 (13) Alaska daylight which could have been anytime but it was in
 (14) late June and we were here before the first scheduled opening
 (15) Q Tell the jury what happened after that
 (16) A We sat and waited on a daily basis for an announcement as
 (17) to whether there would or would not be a fishery in Upper Cook
 (18) Inlet for the 1989 season
 (19) Q How did you get information on that subject?
 (20) A It was made available to us from the cannery office on a
 (21) daily basis
 (22) Q Does the Fish & Game Department down in Soldotna Kenai
 (23) have a tape recording that you could call on a daily basis to
 (24) get information?
 (25) A Yes and that s where the cannery was getting it and we

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- (1) could get it also over the radio There is a program called
 (2) Fisherman s Corner that runs every afternoon and tells what s
 (3) happening as far as if there is going to be openings or
 (4) strength of the run
 (5) Q When did you finally get fishing?
 (6) A We didn t
 (7) Q Well did a time come when you learned you weren t going to
 (8) be able to fish at all?
 (9) A To the best of my recollection I think it was on the 16th
 (10) of July there was a statement made by the Alaska Department
 (11) of
 (12) Fish & Game that there would be no drift gillnet fishery in
 (13) Upper Cook Inlet in 1989
 (14) Q So you caught no fish at all in 1989?
 (15) A That is correct
 (16) Q I take it that was not good for your business?
 (17) A Not at all
 (18) Q Just a very narrow question on a couple of things If you
 (19) didn t fish at all that year were you able to save any money
 (20) that you otherwise would have spent on your fishing business?
 (21) A We changed the oil twice a season and the engine was
 (22) hardly run at all so that didn t occur And I usually go
 (23) through anywhere from eight to a thousand dollars worth of
 (24) diesel fuel and I didn t burn that but other than that
 (25) everything else was basically the same
 (26) Q What s the cost of an oil change?

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- (1) A \$50
 (2) Q So you saved maybe \$900 by not fishing?
 (3) A Somewhere very close to that number
 (4) Q And you had no fishing income in '89?
 (5) A That is correct
 (6) Q As we sit here today it s the 21st of June are you ready
 (7) to fish in Upper Cook Inlet starting next week?
 (8) A I will be after today I will be heading for Kenai
 (9) Q Do you know whether you re going to be able to fish?
 (10) A No sir I do not
 (11) Q Why not?
 (12) A There is a possibility that the Alaska Fish & Game may
 (13) determine that run strength is not strong enough to open on
 (14) Monday the 25th or whatever that Monday is after the 25th
 (15) Q But if they open up you ll be ready to go?
 (16) A I ll be ready to go
 (17) MR LYNCH May we approach the side bar?
 (18) (At side bar off the Record)
 (19) CROSS EXAMINATION OF LES R MEREDITH
 (20) BY MR LYNCH
 (21) Q One question Mr Meredith Did you participate in the
 (22) Exxon Claims Program in 1989?
 (23) A Yes sir I did
 (24) MR LYNCH Thank you no further questions Your
 (25) Honor

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- (1) THE COURT Any redirect?
 (2) MR SCHROER No redirect
 (3) THE COURT Thank you sir You may step down You
 (4) may call your next witness
 (5) MR O NEILL Plaintiffs call Oliver Holm
 (6) THE CLERK Raise your right hand
 (7) (The Witness Is Sworn)
 (8) THE CLERK Please be seated For the record sir
 (9) state your full name your address and spell your last name
 (10) please
 (11) THE WITNESS My name is Oliver Nobel Holm My last
 (12) name is spelled H o l m My address is 3338 Kona Lane
 (13) Kodiak
 (14) Alaska
 (15) DIRECT EXAMINATION OF OLIVER N HOLM
 (16) BY MR O NEILL
 (17) Q Sir what do you do for a living?
 (18) A I m a commercial fisherman
 (19) Q What do you fish for?
 (20) A I fish for herring salmon some halibut and crab in the
 (21) Kodiak Island area
 (22) Q Where do you live?
 (23) A Kodiak Alaska
 (24) Q I ve got a map here Is that Kodiak Alaska right down
 (25) there?
 (26) A Yes

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- (1) Q How long have you lived in Kodiak Alaska?
 (2) A Since 1962
 (3) Q Are you married?
 (4) A Yes I m married to Eva Holm for 25 years
 (5) Q And do you have any kids?
 (6) A Yes we have three children
 (7) Q Does your wife fish?
 (8) A Yes she also fishes She s a setnetter in the Kodiak
 (9) area
 (10) Q Do your kids fish?
 (11) A Kids all fish with us Our youngest is only six
 (12) Q Does he or she fish?
 (13) A He goes out to the fish camp but he doesn t work very hard
 (14) at it
 (15) Q He goofos off at the fish camp is that a fair statement?
 (16) A Yes
 (17) Q You admit that your kid goofos off?
 (18) How old are the other two?
 (19) A The oldest daughter is 21 she fishes with me and the other
 (20) is 15
 (21) Q And are you involved in any fisheries organizations?
 (22) A Yes I m the President of the Board of Directors of the
 (23) Kodiak Regional Aquaculture Association I m the vice chair of
 (24) the Kodiak Fish & Game Advisory and a board member of the
 Area
 (25) K Seiners Association

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- (1) Q How long have you been a commercial fishermen?
 (2) A All my working life I guess I started back in the early
 (3) 60s fishing with my father
 (4) Q When did you get your first paying fishing job?
 (5) A First money I made from fishing was I guess selling halibut
 (6) in 1960 when I was about 12 And my father started paying me
 (7) regularly when I worked with him in 1963 I believe
 (8) Q Is fishing a family thing? Does it go back in your family?
 (9) A Yes it does My grandfather immigrated from Norway to
 (10) Petersburg in 1906 and he fished there and my father fished
 (11) commercially and so I m the third generation that s fished
 (12) Q What did you fish for?
 (13) A Primarily herring and salmon but I also fish for halibut
 (14) and crab in the Kodiak area
 (15) Q And how long have you fished for herring?
 (16) A I fished for herring in the Kodiak area since 1964
 (17) Q How long have you fished for salmon?
 (18) A Since 1964
 (19) Q What gear types do you fish?
 (20) A I currently seine for salmon and seine for herring
 (21) Q Do you use the same boat?
 (22) A Yes I do
 (23) Q And your wife is a setnetter?
 (24) A Yes she setnets She started setnetting with me when I
 (25) was a setnetter back in the 60s

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- (1) Q Would you tell us about your boat?
 (2) A It s a - was a 44 foot fiberglass seiner I finished the
 (3) hull myself in 1979
 (4) Q When you say you finished the hull yourself what does that
 (5) mean? You built the hull?
 (6) A I got a prebuilt fiberglass hull with the engine embedded
 (7) built the cabin decks did all the rigging and made the
 (8) connections to make it work
 (9) Q Let s talk a little bit about herring How long have you
 (10) seined for herring since when?
 (11) A Well I seined with my father in 1964 and then I started
 (12) seining as the operator in 1978
 (13) Q Do you own a fishing permit a herring permit?
 (14) A Yes I do I qualified for one of the original issued
 (15) herring permits
 (16) Q Let s get into that just by way of historical interest
 (17) Nowadays if you want to get a permit you buy the permit
 (18) that s a correct statement?
 (19) A That s correct
 (20) Q But that system had to be set up at some point in time
 (21) Were you there when they set the system up?
 (22) A Yes I was I was already fishing prior to that
 (23) Q And at that point in time did you qualify for the permit?
 (24) A Yes I qualified
 (25) Q And would you tell us what you needed to do to qualify for

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- (1) the permit?
 (2) A You had to participate as a vessel operator for a number of
 (3) years and it was a point system in the case of herring and I
 (4) believe you needed two years to get a herring seine permit
 (5) Q I have put an exhibit number - I put an exhibit which is
 (6) numbered 305 and has been admitted up on the screen Do
 you
 (7) recognize what it is a depiction of?
 (8) A Yes this depicts the Kodiak herring management area
 (9) Q Where do you fish?
 (10) A Well I fish over a good deal of the island I could show
 (11) you
 (12) Q Do you want a pointer Now go ahead and try it with the
 (13) pen and you should have an arrow?
 (14) A Start off the season in the west side of Afognak in these
 (15) bays up here in the north end Technically move down into the
 (16) Uganik system these bays
 (17) Q Raise your voice please
 (18) A Over around Uyak around the town fish the east side and
 (19) Uyak Bay Beluga move into the Uyak Bay Zachar and Uyak
 (20) Occasionally I fish down in the south end of the Alitak area
 (21) There is a lot of fishing that goes on around Old Harbor but I
 (22) don t participate in that usually And then there is
 (23) fisheries on the mainland but I only get over there
 (24) occasionally
 (25) Q When did you fish for herring?

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- (1) A The season starts April 15th at noon every year
 (2) Q And when does it generally go until?
 (3) A It opens at noon on odd numbered days through June 30th
 and
 (4) as the quota or guideline harvest numbers are met those
 (5) particular areas close So there is usually always some area
 (6) to fish in but the areas with most fish the quotas are taken
 (7) and you get down to a reduced area at the end of the season
 (8) Q We made a video of your fishing operation which you ve
 (9) seen before and with the Court s permission I would like to
 (10) show it to the jury and have you explain your fishing operation
 (11) and your boat and your gear type?
 (12) THE COURT Before or after we take our break?
 (13) MR O NEILL Let s go have a sandwich
 (14) THE COURT Take our second recess break at this time
 (15) be in recess for 15 minutes
 (16) (Jury out at 12 00)
 (17) (Recess from 12 00 to 12 15 p m)
 (18) (Jury in at 12 15)
 (19) BY MR O NEILL
 (20) Q Before we put on the videotape let me ask you a couple
 (21) more background questions Have you had a job other than
 (22) fishing in your life?
 (23) A Not since I was in college washing dishes
 (24) Q When you fish for herring or when you - when you fish for
 (25) herring did you use a spotter plane ever?

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- (1) A Yes we do
 (2) Q Would you explain to the jury what a spotter plane is so
 (3) when we see the plane in the tape we know what it s role is?
 (4) A The spotter plane is a small aircraft that the pilot looks
 (5) for herring You can see herring from looking down into the
 (6) water You can see better from the air than the boat and
 (7) he ll direct you where the herring are to make the set
 (8) Q Now I m requesting to play the tape and you re very
 (9) soft spoken so instead of looking on that screen I ll suggest
 (10) you look over here so we force you to talk into the
 (11) microphone If you d just tell the jury what is happening on
 (12) the tape?
 (13) A This is my seine boat ready to fish herring That s my
 (14) daughter she s crewing on the boat That s me on the flying
 (15) bridge waiting for instructions from the spotter pilot
 (16) That s the spotter pilot taking off to look for herring in the
 (17) Uyak Bay area We were cruising around trying to get in
 (18) position He s seeing some herring try to get us in position
 (19) to set on them I like to get them in shallow water near the
 (20) shore There it is ready to let loose Got the word The
 (21) skiff pulls out the end of the seine and we start to let out
 (22) fine mesh net inch and a quarter mesh The skiff holds it in
 (23) near the beach so the herring can t get around that end set
 (24) fairly rapidly before they can swim away
 (25) Then the skiff starts towing his end towards the boat come

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- (1) back around in a circle coming back up to the skiff The fish
 (2) are trapped between the shore and the net now Pull the ends
 (3) together we join up with the skiff The skiff man now passes
 (4) off a line to the end of the seine to my daughter attach that
 (5) end to the boat The skiff goes on outside the net now We
 (6) have got the ends attached to the boat and the next stage will
 (7) be to get the purse line running through the rings at the
 (8) bottom of the net draw the bottom part the weighted all
 (9) right Will trap the herring so they can t dive out the
 (10) bottom You can see the purse lines being hauled in I m
 (11) purse Sue is picking up the breast line It takes several
 (12) minutes to get the bottom of the net pursed up
 (13) Now we re just about done pursing and get the net back on
 (14) the boat and the skiff holds the net There we have the ring
 (15) all towed up Now the herring can t get out of the net They
 (16) are trapped in there now Then we have to pull the purse line
 (17) back through the rings so we can stack the net
 (18) Q Why is your daughter doing all the work?
 (19) A Because I m the skipper See here I do work On a
 (20) three man crew like I usually fish I help stack the seine but
 (21) she has to stack the led line the heavy part The net is 600
 (22) feet long weighs several thousand pounds
 (23) The fish keep getting confined in a smaller and smaller
 (24) area Here we have them bagged up alongside the boat With
 (25) herring we take a sample If the fish don t have ripe eggs in

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- (1) them we let them go If they were spawned out or not enough
 (2) eggs we wouldn t keep them We take a 20 pound sample of
 (3) herring and we break them open and see how many males
 there
 (4) are how many females and how many have good eggs that the
 (5) Japanese will buy
 (6) There we have good roe coming out of the herring
 (7) Q Everybody is closing their eyes
 (8) A These fish are ready to spawn probably in a few hours
 (9) That s the spotter plane He s coming down to see what we
 (10) got We have a little over two pounds out of a 20 pound
 (11) sample 12 percent that s good herring We will keep that
 (12) That s a fairly small set We will lift them aboard and put
 (13) them down in the ice hold and ice and water These fish will
 (14) run to Kodiak 80 mile 90 mile run and sell them to the
 (15) cannery Going down in the fish hold to an ice and water
 (16) bath This was filmed late in the season and sometimes we get
 (17) bigger sets than that We are all done waiting for another
 (18) set
 (19) Q You said you take your fish to the processor and what
 (20) happens physically when you take your fish to the processor?
 (21) A We will - they will be pumped out of the boat with a fish
 (22) pump put in totes and they will do another sample at the
 (23) cannery and we will get paid based on the roe percentage of
 (24) that sample and we would get paid on the frozen weight when
 (25) they freeze them and box them

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- (1) Q Now I want to talk about the 1989 Kodiak herring season
 (2) Did the oil spill impact your herring season?
 (3) A Yes it did
 (4) Q And in what way?
 (5) A There were a number of areas where I usually fished that
 (6) were closed because of the presence of oil before we got a
 (7) chance to fish in them We did get to fish in some areas but
 (8) many of the areas we couldn't fish in
 (9) Q With regard to the areas that you were able to fish in was
 (10) there any extra crowding extra boats as a result of there
 (11) being closures in other places?
 (12) A Yes there was All the boats got crowded down into an
 (13) increasingly number of smaller areas that were open
 (14) Q Did that result in less fish for you?
 (15) A Yes it did
 (16) Q Did you see oil in your fishing grounds in 1989?
 (17) A Yes I did in numerous places The ones that stick
 (18) vividly is in Marmot Bay We ran through oil for about six
 (19) miles and the west side of Kodiak from out late cape to Uyak
 (20) Bay 40 miles of sheen and mousse patties in the middle of
 (21) May
 (22) Q Now I want to talk briefly about salmon fishing and the
 (23) Exxon Valdez oil spill Did the Exxon Valdez oil spill impact
 (24) your family salmon fishing in 1989?
 (25) A Yes it did Neither my wife or myself or any of our

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- (1) family members were able to fish in 1989 for salmon
 (2) Q So Kodiak salmon was closed in 1989?
 (3) A Clearly all of it One setnet area on the south end was
 (4) open
 (5) Q And that isn't your wife's setnet?
 (6) A No she was fishing the northwest Kodiak district That
 (7) was closed
 (8) Q How about seining?
 (9) A It was closed for the entire year with one minor
 (10) exception
 (11) Q And are you prepared to fish this year?
 (12) A Yes I am
 (13) Q And do you have any doubts as to whether you're going to
 (14) be able to fish this year?
 (15) A No I don't believe so I guess we have doubts that we
 (16) could fish in Red River
 (17) Q Red River hasn't opened yet?
 (18) A The Ayakulik
 (19) Q And that's a red salmon fishing area in the Kodiak
 (20) fisheries management area?
 (21) A Right It's an area I don't usually fish in much myself
 (22) but if the boats will fish or can't fish there they will end
 (23) up fishing on the north end where I fish
 (24) MR O NEILL Thank you
 (25) BY MR O NEILL

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- (1) Q Did you participate in the Exxon claims program in 1989?
 (2) A Yes I did
 (3) CROSS EXAMINATION OF OLIVER N HOLM
 (4) BY MR SANDERS
 (5) Q Mr Holm I just have a couple questions to ask you My
 (6) name is Jim Sanders I represent the Exxon defendants and I
 (7) don't believe we've ever met correct?
 (8) A Correct
 (9) Q Let me start approximately where Mr O Neill left off As
 (10) president of the Kodiak Association do you or that association
 (11) run or operate a hatchery?
 (12) A Yes the Kodiak Regional Aquaculture Association operates a
 (13) state owned hatchery at Kitoi Bay and also at Billy Creek
 (14) that's state owned
 (15) Q And the Kitoi hatchery if I could just call it that the
 (16) short form the Kitoi hatchery sold fish in 1989 is that
 (17) correct?
 (18) A That's correct
 (19) Q And what kind of fish did the hatchery sell?
 (20) A Almost entirely pink salmon
 (21) Q And the - were you involved in that or as president were
 (22) you knowledgeable of how that was done?
 (23) A Yes I was involved in setting up the bidding process and
 (24) getting the fish sold at the beginning I wasn't there through
 (25) the whole process though

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- (1) Q But you were there in setting up the bidding process?
 (2) A Yes
 (3) Q And in doing that did you receive bids from other
 (4) processors?
 (5) A We got bids from a number of processors because there was
 (6) no other - virtually no other salmon coming into Kodiak then
 (7) Q So the bids you got I take it were pretty good bids?
 (8) A Yes they were at the beginning
 (9) Q Because the supply of those fish for those processors was
 (10) so restricted that they were willing to pay more money?
 (11) A I presume that would be why They were willing to pay a
 (12) good price at the beginning let's put it that way
 (13) Q And to give us just an idea what was the range of that
 (14) good price at the beginning?
 (15) A At the beginning I think the bids ran from around 60 to
 (16) 70 as high as 70 some cents There was a variation from lot
 (17) to lot We sold them in separate lots So even in the same
 (18) day different lots went for different prices
 (19) Q I'm talking about a range and you don't mean to suggest
 (20) there was one price paid at the beginning but it ranged as
 (21) high as 70 or so?
 (22) A If my memory is correct I believe it was a little over 70
 (23) Q And then later on down as life always is the price would
 (24) come down some toward the end so 70 wasn't the average
 (25) price that you got for pink salmon throughout the bidding or the sale

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- (1) process correct?
 (2) A Correct I believe the average was closer to 55 cents
 (3) Q And as a result of those sales the Kitoi hatchery as
 (4) distinct from you fishermen sold fish in the neighborhood of
 (5) what ten million dollars?
 (6) A Correct
 (7) Q And then that money wasn't dispersed out to you all it had
 (8) to stay in the hatchery I think by law is that correct?
 (9) A That's correct
 (10) Q So let's talk just a second if you don't mind what does a
 (11) hatchery do? As I understand it you and your fellows operate
 (12) the hatchery to improve the fishing for future generations
 (13) correct?
 (14) A Yes we operate the hatchery to produce fish
 (15) Q And the Kitoi hatchery hatches pink salmon correct?
 (16) A Yes
 (17) Q Are there any other fishes or stocks that the hatchery
 (18) produces?
 (19) A We do produce some chum salmon and some coho salmon
 and
 (20) some red salmon
 (21) Q And the money that is put into the hatchery is used to
 (22) first maintain the hatchery I guess?
 (23) A You mean what is the budget operational budget? We have
 (24) to maintain the hatchery we have some capital items we have to
 (25) purchase we have salaries and fish food

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- (1) Q Fish food?
 (2) A Yes
 (3) Q You have to kind of fertilize the hatchery to give the fish
 (4) nourishment so they will grow and do what they are supposed
 to
 (5) do in the hatchery right?
 (6) A After they hatch we get better survivals if we feed the
 (7) fish before they are released
 (8) Q So now this money that the hatchery uses is to maintain the
 (9) fish hatchery and do those other things that you described
 (10) including salaries and feeding the fish and those other things
 (11) correct?
 (12) A Yes
 (13) Q And as a result of having this 10 million dollars which by
 (14) law has to stay with the hatchery the kind of the overhead for
 (15) the hatchery for the next several years is kind of taken care
 (16) of right?
 (17) A It will pay the operational costs for the hatchery for
 (18) quite awhile
 (19) Q After the year 2000?
 (20) A Yes should
 (21) Q And as president are you a salaried person?
 (22) A No I get no salary whatsoever
 (23) Q And you obviously don't have from your answer to
 (24) Mr O'Neill's question you don't have a second job?
 (25) A That's correct

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- (1) Q Let me ask you a couple questions about the fishing
 (2) business and you'll have to pardon my ignorance I don't know
 (3) nearly as much about it as you do
 (4) The fishing business itself goes in cycles doesn't it?
 (5) A Yes it goes up and down some That's why I'm diversified
 (6) Q And by diversification you mean you have different kinds
 (7) of permits and you do different kinds of fishing?
 (8) A Yes I catch four different species of - four different
 (9) types of fish
 (10) Q That's herring salmon -
 (11) A Halibut and crab crab sometimes
 (12) Q And it has been the life of fisherpersons in Kodiak and
 (13) Prince William Sound and Upper Cook Inlet back to the time
 (14) that you were fishing as a youngster that there are good years
 (15) and bad years depending on which species and other
 conditions
 (16) some of which are not even known right?
 (17) A Yes there is fluctuations
 (18) Q And as was pointed out with the previous witness and I
 (19) would like to make the point with you sir how much money you
 (20) make in a given year setting overhead aside for a second how
 (21) much money you make is dependent upon basically two things
 how
 (22) many fish you catch and what price you get for that per
 (23) pound?
 (24) A Right in the end There is quite a few factors that go
 (25) into those two things

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- (1) Q I'm sorry?
 (2) A There is quite a few factors that go into determining how
 (3) much you catch
 (4) Q Right I understand that But the way you get paid for
 (5) example on pink salmon is by the pound right?
 (6) A Yes
 (7) Q And so the number of pounds times the price per pound I
 (8) guess averaging it out over lots is the income the money that
 (9) comes in to you?
 (10) A Correct Sometimes there is a difference in price for
 (11) lower quality pinks though
 (12) Q And I take it that all things else being equal the higher
 (13) quality gets a bigger price and the lower quality gets a lower
 (14) price?
 (15) A Generally Hopefully most of the fish we catch are high
 (16) quality only occasionally we catch lower fish to get the lower
 (17) price
 (18) Q Part of the skill is trying to get the higher quality fish
 (19) or the right times to get the higher quality fish is that
 (20) right or is that just luck?
 (21) A Well partly it's Fish & Game management to try to endeavor
 (22) to not let us - to conduct the fishery so that we don't get
 (23) water marked fish
 (24) Q And water marking is fish that are old and about to spawn
 (25) and die correct?

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- (1) A Correct As they enter fresh water get closer to spawning
 (2) time they deteriorate
 (3) Q And that s lower quality?
 (4) A Right
 (5) Q Now in these cycles I take it that let s take salmon for
 (6) example when you are salmon seining you are catching what
 (7) mainly pinks?
 (8) A Most years the biggest weight would be pinks 1992 I
 (9) believe I had more reds than pinks or very closely the same
 (10) but mainly more pinks Dollar value it s split between reds
 (11) and pinks
 (12) Q Because reds are a lot more valuable per pound than the
 (13) pinks?
 (14) A Correct
 (15) Q So sometimes you had to catch twice as many pinks to have
 (16) the same income as what you get from the reds?
 (17) A Right
 (18) Q Roughly?
 (19) A Roughly
 (20) Q Now did you have a real good year in 1988 in salmon?
 (21) A Yes I did
 (22) Q Can you - I don t want to get into your personal business
 (23) but could you give the jury an idea of how much your income
 was
 (24) from your salmon operation in 1988?
 (25) A It was over \$300 000 for my crew and myself

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- (1) Q And then of course you got overhead and you ve got other
 (2) people to pay but that s a good year?
 (3) A Best year I ve ever had
 (4) Q And then if you back that off into 1982 or 3 how would
 (5) you compare that so the ladies and gentlemen of the jury can
 (6) get the range?
 (7) A It was lower I don t remember specifically what those
 (8) figures are for 82 or 83
 (9) Q 84 85? It s not a memory test but can you give us -
 (10) A I ve seen those recently but I couldn t tell you exactly
 (11) what they are
 (12) Q And then of course as you mentioned you re diverse so
 (13) you would add to that the money you made in the herring catch
 (14) that year?
 (15) A Correct
 (16) Q After you ve taken out your overhead and everything else
 (17) and then your crab and then your halibut?
 (18) A Right
 (19) Q Now you mentioned your boat and I wasn t quite clear on
 (20) whether you still have that boat - it sounded kind of like you
 (21) used to have that boat?
 (22) A Maybe because it used to be 44 feet long and now it s 48
 (23) feet long Same boat though
 (24) Q When did you buy the boat?
 (25) A 1979 78 that winter

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- (1) Q And you then lengthened it?
 (2) A Yes I just did that this winter
 (3) Q When you - I take it from the success that you indicated
 (4) in your business that the boat was paid for prior to your
 (5) lengthening it?
 (6) A Yes it was
 (7) Q And as a result of lengthening it have you gone into debt
 (8) for that or were you able to pay for that out of cash?
 (9) A I was able to pay for that out of cash
 (10) Q Do you have more than one boat?
 (11) A No I don t I do have - we do have skiffs for my wife s
 (12) setnet operation and the skiff that s on the video and another
 (13) skiff
 (14) Q And you have to have a permit do you not for your salmon
 (15) seining operation and your herring seining operation?
 (16) A Correct
 (17) Q And Mr O Neill asked you about your herring permit that
 (18) was one you got because you were qualified back in 1970
 (19) something?
 (20) A Right The last qualifying year was 1980
 (21) Q And did you have to pay anything for that other than just a
 (22) license fee?
 (23) A No We were fishing before it was necessary to have one
 (24) Q So you didn t have to go into debt or pay out any cash to
 (25) get your herring seine permit?

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- (1) A No I ve been doing it for 30 years so I didn t have to
 (2) Q And salmon is the same true for your salmon permit?
 (3) A No I qualified for setnet salmon permit in Kodiak in
 (4) 1972 They didn t issue the permits until actually 1974 and I
 (5) built a boat myself to go seining and I couldn t use the setnet
 (6) permit and I traded to my father my setnet permit for the seine
 (7) permit that he had qualified for originally and that s the
 (8) permit I m still fishing
 (9) Q So did he require you to give any booty on that trade or
 (10) was that a swap without money?
 (11) A It was a swap without money
 (12) MR SANDERS I think that s all I have Thank you
 (13) Mr Holm
 (14) MR O NEILL Everybody tells me I have no questions
 (15) THE COURT Thank you sir You may step down You
 (16) may call your next witness
 (17) MR JAMIN Thank you Your Honor The plaintiffs
 (18) call Mary Jacobs
 (19) THE CLERK Raise your right hand
 (20) (The Witness is Sworn)
 (21) THE CLERK Please be seated For the record state
 (22) your full name your address and spell your last name please
 (23) THE WITNESS My name the Mary Jacob My address is
 (24) Box 3080 Kodiak Alaska My last name is spelled
 (25) J a c o b s

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- (1) DIRECT EXAMINATION OF MARY JACOBS
 (2) BY MR JAMIN
 (3) Q Good morning - good afternoon now How are you employed?
 (4) A I m employed commercial fishing
 (5) Q What resources do you fish?
 (6) A Primarily I fish salmon and herring I do some halibut
 (7) but mostly in the Kodiak Island area
 (8) Q Have you fished in other fisheries as well?
 (9) A Yes
 (10) Q What are they?
 (11) A Oh I fished in quite a few fisheries back in the 70s
 (12) I ve done shrimp and crab but in the past 10 15 years it s
 (13) been primarily salmon and herring
 (14) Q Are you married?
 (15) A Yes I m married to Tom Dooley
 (16) Q Do you have children?
 (17) A I have three children My oldest son is 23 years old his
 (18) name is Locke He s fished with us since he was a baby I
 (19) have a daughter that s 18 Felika (ph) She s currently
 (20) fishing with my husband as is Locke She s just graduated
 (21) from high school valedictorian and she s going to be paying
 (22) for her living expenses room and board at college with her
 (23) fishing income
 (24) Q Do you have a third child?
 (25) A Yeah I have a third child Anuila Dooley (ph) and she s

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- (1) just five and she s going to start on the boat with me this
 (2) summer
 (3) Q How long have you been fishing salmon on Kodiak?
 (4) A The first year I fished salmon on Kodiak would have been
 (5) 1971
 (6) Q Was that about 23 years?
 (7) A 23 years
 (8) Q And did you start off as a operator of a vessel?
 (9) A No I started off on the deck I didn t know much of
 (10) anything in those days and I progressed to where I was working
 (11) in the skiff and then 1979 would have been the first year I
 (12) operated my own boat
 (13) Q And how big a vessel was that 1979?
 (14) A That boat was 29 6 feet long It was built in the 20s a
 (15) wood boat They called it a Karluk dory and it was pretty
 (16) crude but it was a way to start
 (17) Q Do you still have that 29 6 footer?
 (18) A No I don t I m on my fourth boat I ve upgraded
 (19) Q Could you describe briefly what the vessel is now that you
 (20) use?
 (21) A The vessel I use now is 51 foot fiberglass with a top house
 (22) with auxiliary engine to run an RSW which is refrgerated sea
 (23) water so I can fish fairly comfortably in fairly rough weather
 (24) and deliver high quality product
 (25) Q Let s get a little idea where it is that you fish Could I

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- (1) pull up 305? You can take a look at the screen next to you
 (2) whatever is easier for you or you can look far away
 (3) A I ll look over there
 (4) Q What is this a picture of?
 (5) A This is the Kodiak management area for salmon and so we
 (6) fish this entire district from Cape Douglas off the top down to
 (7) Cape Igvak and Kilokak Rocks on the mainland
 (8) Q When you say Cape Douglas to Igvak that on the peninsula?
 (9) A Yes
 (10) Q Where else do you fish?
 (11) A All the way around Kodiak and Afognak and Shuyak Island
 (12) Do you want me to point these out?
 (13) Q And you can get that and work that that s great
 (14) A No I better not touch it
 (15) Q Maybe the pointer is working now Just don t touch the
 (16) screen and you re going to be okay
 (17) A Here is the bottom of the district
 (18) Q You re going to have to speak up loud when you re away
 (19) from the microphone?
 (20) A And then we fish all the way around the islands this is
 (21) Afognak this is Shuyak -
 (22) Q Do you want to come down and use the screen? Mr Sanders
 (23) suggested it might be a good idea Don t usually have
 (24) Mr Sanders quite as helpful with my witnesses
 (25) A This is Cape Douglas We fish from here down to Kilokak

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- (1) Rocks on this area and all the way around Kodiak Island
 (2) Trinity Islands around here This is Afognak within three
 (3) miles of the coastline Do you want me to stay here?
 (4) Q That s okay you can go back now Let s get an idea Ms
 (5) Jacobs as to the duration of the period you re actually
 (6) fishing in this Kodiak fishery?
 (7) A The first opening is June 9th and the season lasts through
 (8) the month of September Ordinarily there is openings and
 (9) closures according to escapement at the different streams So
 (10) very often some areas are open for weeks at a time and we
 (11) move
 (12) around between the open areas and you know if one area is
 (13) closed we will move to an open area We do a lot of
 (14) traveling We ordinarily will fish 60 to 75 days out of that
 (15) three and a half month period but we very infrequently go back
 (16) to town during that three and a half month period
 (17) Q Before the season starts before June 9th are there any
 (18) activities associated with your commercial fishing operation?
 (19) A Well I fish herring in April and May so the month of
 (20) March is devoted to getting the boat ready getting the nets
 (21) ready There is also a lot of work to do to the boat There
 (22) is usually one net to hang which means tying the net the web
 (23) to the cork line and to the led line It s about a week or ten
 (24) day process putting a net together with the whole crew and
 (25) myself working on it
 (25) Q When you talk about the cork line is that the part of the

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- (1) net that s on top of the water?
 (2) **A** Right the corks float the top of the net and the leads
 (3) sink the bottom of the net
 (4) **Q** Now have you had a video prepared of your operation?
 (5) **A** Yes
 (6) **Q** Let s take four minutes together with the Court s
 (7) permission I ll have you narrate that?
 (8) **A** This is my boat Renaissance I m going down Shelikof
 (9) Straits going to an opening that s happening at noon in June
 (10) first opening This is Seven Mile Beach There is several
 (11) other boats around there waiting for the opening
 (12) That s Billy Smith He s my skiff man He s been fishing
 (13) with Tom or I for 12 years I m looking at the bottom depth to
 (14) see to plan where I m going to put my net The net draws
 (15) about 75 feet of water and it costs about \$30 000 I don t
 (16) want to put it anywhere
 (17) That s Billy pulling off the end of the net and while he s
 (18) doing that I have forward momentum to set the whole net This
 (19) net is a quarter mile long You can barely see the skiff back
 (20) there at the other end of the net We ve got the net out
 (21) we - they call it holding hook you have it in a hook shape
 (22) formation for about 30 minutes and while the fish are swimming
 (23) down the beach into the net and they meander the cork line of
 (24) the net for about those 30 minutes until we close the ends
 (25) together what we have to do is make bubbles at both ends of

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- (1) the net with a plunger pole to keep the fishing from coming out
 (2) by the boat end or skiff end
 (3) After the 30 minutes we come together put the two ends
 (4) together Pulling the purse line over to the winch there to
 (5) pull up the bottom of the net At the same time we re pulling
 (6) in some of the lead end of the net they call this So we pull
 (7) the net the skiff holds the boat in position so the hole is
 (8) small so the fish don t go out and we have a person stacking
 (9) the cork line and a person stacking the led line So it s
 (10) stacked up neat so it s ready to go back out again This
 (11) process takes about a half hour to bring the net in so the
 (12) process is about an hour
 (13) I m pursing pulling up the bottom of the net at the same
 (14) time Now we re pursed the rings are up and now the fish are
 (15) entrapped in the net We still have a lot of net but they
 (16) don t ordinarily get away There is a few jumpers in there
 (17) got a few reds They are exciting to catch because they will
 (18) jump around in the net
 (19) Now as we pull the net we ve got a few flounder so we stop
 (20) and pull them out of the web and throw them back overboard
 (21) alive Just feeding the purse line and just keeping an eye on
 (22) things The reds are jumping around in the net They are
 (23) getting spun up in the net We have a few to pick out and
 (24) gently put them into the refrigerated water while they are
 (25) still alive There is a few more reds As you can see I ve

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- (1) got a full fish hold full of water and it s at 30 degrees
 (2) There is another boat sitting there behind us As we
 (3) continue to pull the net a few more fish few more flounders
 (4) few more red salmon They call this the monkey bag This is
 (5) where most of our fish will lay We ll pull them aboard
 (6) That s probably 150 possibly 200 reds and we try to get them
 (7) up in the middle of the boat so they don t spill on the deck
 (8) and have to be handled so they go directly into the fish hold
 (9) We ll do this process 8 to 12 times a day and deliver at
 (10) night We have to get the end of the net over the block tie
 (11) it down bring the skiff back up on the stern and tie it up and
 (12) then we re all ready to go again Clean up the deck so it s
 (13) not slippery It s mechanical after awhile Here we are
 (14) ready to go again
 (15) **Q** Okay After you get the fish on board the vessel and
 (16) you ve gone through these 8 or 10 or 12 sets during the day
 (17) where are you delivering the fish?
 (18) **A** The cannery or the processor sends out tenders and we
 (19) have
 (20) to run to wherever they are anchored in some protected water
 (21) Sometimes they are close by sometimes they are a couple
 (22) hours
 (23) away but we go to them at night and pitch the fish off one by
 (24) one into brailers that weigh about a thousand pounds weigh the
 (25) bags of fish then we get a fish ticket for whatever we deliver
 (26) and they the fish go on to the tender into their refrigerated
 (27) sea water and then they haul them to the processor

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- (1) **Q** At the conclusion of the season when the salmon season is
 (2) done do you have post season fishing activity?
 (3) **A** Yes we sure do
 (4) **Q** What s that?
 (5) **A** After - at the end of the season I ve been more or less
 (6) at sea for six months and I have a lot of things to catch up
 (7) with on the business end of the boat and book work I have
 (8) settlements to be done with my crew because they get a
 (9) percentage of the take and I have the boat to winterize and
 (10) ordinarily things that have to be repaired zinks that have to
 (11) be replaced that ensure there is not electrolysis on the boat
 (12) I m pretty much a month at the end of the season just doing the
 (13) finalizing of the season
 (14) **Q** Now did you fish in 1989?
 (15) **A** I didn t fish in the Kodiak area at all in 1989
 (16) **Q** What happened to your permit in 1989 with Kodiak?
 (17) **A** 1989 was the year my daughter Anulia (ph) was born so I
 (18) had intended on taking the year off I did a medical transfer
 (19) with my permit to another person that did not own a permit and
 (20) then I - so that was the only way I could get a little bit of
 (21) income because I was medically unable to fish the season
 (22) **Q** Did the medical transfer allow you to retain an interest in
 (23) the permit so you would have made some income?
 (24) **A** Ownership stays with me although he has control of it
 (25) during the time I have the medical transfer and so I can get a

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- (1) percentage of his take and not have to be out there myself and
 (2) the Entry Commission allows this to be done for up to a
 (3) two year period for people that have medical disabilities
 (4) Q Was your permit fished in 1989 to permit you to get a
 (5) percentage of the gross?
 (6) A No there was no salmon fishing on Kodiak Island for seine
 (7) fishing that year
 (8) Q Have you fished your permit since the 89 season?
 (9) A Yes I have
 (10) Q And do you intend to go fish in Kodiak again this season?
 (11) A Yes I do
 (12) Q If you weren t here testifying today would you be involved
 (13) in the fishery?
 (14) A The fishery is open right now and has been since the 9th
 (15) and I should be there
 (16) Q I think the cross examination will end before two so you ll
 (17) probably be able to get out tonight
 (18) Besides fishing Ms Jacobs do you have any other source
 (19) of income at all?
 (20) A No I don t
 (21) MR JAMIN Thank you
 (22) MR SERDAHELY Your Honor we have no
 (23) cross examination of this witness Thank you
 (24) THE COURT Thank you You can go fish
 (25) MR JAMIN Judge thank you on behalf of us and

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- (1) Ms Jacobs
 (2) THE COURT Call your next witness
 (3) MR JAMIN Your Honor plaintiffs call Tom Dooley to
 (4) the stand
 (5) THE CLERK Please raise your right hand
 (6) (The Witness Is Sworn)
 (7) THE CLERK Please be seated For the record sir
 (8) state your full name your address and spell your last name
 (9) please
 (10) THE WITNESS My name is Larry Tom Dooley I go by
 (11) Tom Dooley My address is 1089 Sawmill Circle in Kodiak and
 (12) my last name is spelled D-o-o-l-e-y
 (13) DIRECT EXAMINATION OF L TOM DOOLEY
 (14) BY MR JAMIN
 (15) Q Sir how are you employed?
 (16) A I m a commercial fisherman
 (17) Q Are you an Alaska resident?
 (18) A Yes sir
 (19) Q How long have you been here?
 (20) A Since 1963
 (21) Q What sort of formal education do you have?
 (22) A I ve got a high school GED equivalent that I got in the
 (23) Navy
 (24) Q I m going to try to create a little suspense but it s not
 (25) going to last Are you married?

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- (1) A 24 and a half years happily married
 (2) Q Who are you married to?
 (3) A Mary Jacobs She said at 25 years she s going to take my
 (4) last name
 (5) Q She s the woman who was just on the stand before you?
 (6) A Yes sir
 (7) Q Now I want to talk a little bit about your fishing
 (8) history When did you first get involved in fishing?
 (9) A I started commercial fishing in 1965
 (10) Q What were the circumstances?
 (11) A I started crab fishing for Wild Bill Winecope on the crab
 (12) boat Sabatas (ph)
 (13) Q When you were working with Mr Winecope was that as a
 (14) crewman?
 (15) A Yes
 (16) Q What fishery?
 (17) A King crab fishing in the Kodiak area and then salmon
 (18) fishing in the Kodiak area up through 1969
 (19) Q Did there come a time when you were able to purchase a
 (20) vessel on your own?
 (21) A Yes sir I bought my first boat a skiff 24 foot jitney
 (22) and named it after Alise my first daughter
 (23) Q What was it like to fish on the Alise?
 (24) A Pretty rugged No hydraulics no power of any kind except
 (25) an outboard motor to propel it through water And we used a

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- (1) hundred fathom seine 600 feet lighter led line than what
 (2) you ve been seeing in the video but we pulled it in by hand
 (3) no hydraulics strictly set the seine and you pull it back
 (4) sometimes as high as 14 15 times in one day but I was a lot
 (5) younger then
 (6) Q So when we saw your wife s video and Mr Holms they had a
 (7) big power block?
 (8) A Yes sir
 (9) Q And you don t have one of those?
 (10) A I was the power block
 (11) Q Did you ever get a chance to buy a more advanced or
 (12) somewhat bigger vessel sir?
 (13) A Yes sir I went through a series of open jitneys that
 (14) you know you had to be careful the weather you were running
 (15) in
 (16) and traveled in and you were a lot more restricted in the
 (17) weather you could work but I made the big jump in 1968 the
 (18) fall of 68 is when I made that down payment on it and
 (19) actually no it was 78 I m sorry I don t know I m
 (20) confused 1978 is when I contracted it and 1979 was the first
 (21) year I fished that boat It was a 38 foot decked over
 (22) fiberglass seiner and it was a real step forward for me in my
 (23) fisheries
 (24) Q And currently sir what size vessel do you use?
 (25) A I ve got a 51 foot fiberglass seiner looks almost
 identical to my wife s except it s two years older and two foot

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- (1) narrower
- (2) Q Now as of the time of the Exxon Valdez oil spill in March
- (3) of 89 what permits did you own sir?
- (4) A I owned a Prince William Sound herring permit and I had a
- (5) Kodiak salmon permit and a Kodiak herring permit seine
- (6) permit
- (7) Q What had been your pattern with respect to fishing prior to
- (8) the spill?
- (9) A My normal pattern was go to Prince William Sound I would
- (10) run from Kodiak to Prince William Sound It's about 360 miles
- (11) I always figured from Kodiak to Cordova where I'd usually wait
- (12) for the fishery and then fish that and then I would return
- (13) from Prince William Sound back to Kodiak and then if the timing
- (14) was right I'd get maybe two or three days of fishing in the
- (15) Kodiak area for herring there but I bet a little bit more
- (16) money heading on to Kodiak down through the chain through
- (17) False Pass and back up the Bering Sea
- (18) Q Is that down the Alaska Peninsula and back up?
- (19) A Yes and back up to the Togiak area for herring fishing
- (20) there That's about 900 miles And then after the season was
- (21) over there I would come back through False Pass back to
- (22) Kodiak and the timing was right and if there were still a few
- (23) areas open that would look like it would pay me I would go
- (24) ahead and fish herring in Kodiak
- (25) And a lot of it had depended on when the halibut openings

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- (1) were If a halibut opening went I would go halibut fishing
- (2) and then quick as that we would change gear go halibut
- (3) fishing come back in and change gear and go salmon fishing in
- (4) the Kodiak area
- (5) Q So then you would fish on Kodiak Island for salmon?
- (6) A Correct the same general area that Mary pointed out
- (7) Q That your wife talked about?
- (8) A Right
- (9) Q Now sir in 1989 was your normal pattern in place you
- (10) were going to go up to Prince William Sound to go herring
- (11) fishing?
- (12) A No sir it wasn't The oil spill happened and it kind of
- (13) threw a monkey wrench in my whole year That was the year I
- (14) built my boat that I own now new it was coming out of the
- (15) shipyard that spring and so it was a pretty devastating year
- (16) to me all in all
- (17) Q Were you able to fish herring in Prince William Sound at
- (18) all?
- (19) A No sir
- (20) Q Now did you get a chance to go over to Togiak over by
- (21) Bristol Bay?
- (22) A Yes sir I did
- (23) Q Was that a normal herring season over there?
- (24) A It was a normal herring season and I had an exceptional
- (25) good year that year

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- (1) Q Did you come back to Kodiak after Togiak and get a chance
- (2) to salmon fish that year?
- (3) A Yes sir I did I come back and got all the gear aboard
- (4) and was set up ready to go salmon fishing and we didn't know
- (5) from one day to the next if we were going to get to fish or
- (6) not We attended a lot of meetings and a lot of discussion
- (7) and it was up in the air for quite awhile We didn't know
- (8) whether we were going to get to work or not but feelings run
- (9) pretty high and somewhere along if my memory serves me
- (10) correctly somewhere around the 20th of June I had a guy call
- (11) me and offer me a contract for tendering in Bristol Bay and I
- (12) didn't know if we were going to fish in Kodiak or what was
- (13) going to happen total confusion but I felt like that I had to
- (14) do something make sure that I had money to get through the
- (15) winter with and by taking that Bristol Bay contract it would
- (16) have guaranteed me some income for the winter coming on
- (17) and it
- (18) was getting late in the season and so I did that
- (19) Q Now after the Bristol Bay tendering contract did you come
- (20) back to Kodiak?
- (21) A Yes I did I come back to Kodiak and just kind of stood
- (22) by and I think there was a reference earlier to some of the
- (23) boats fishing in Kitor Bay area and I put my name in for that
- (24) but was not one of the ones that got lucky
- (25) Q So you didn't get a chance to fish salmon at all in 89?
- (26) A No sir not at all

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- (1) Q Now I want to ask you about your herring fishing up in
- (2) Prince William Sound since 89
- (3) Did you go up in 1990?
- (4) A Yes sir I did And 1990 was the first year after the oil
- (5) spill and I personally had a real good season As a matter of
- (6) fact I made the front page on the Anchorage Times
- (7) Q Now how was the season in 93?
- (8) A 93 wasn't good for me and I actually remembered now is
- (9) the year - I haven't had a good year since 1990
- (10) Q Did you get any fish in 93 sir up in Prince William
- (11) Sound?
- (12) A We didn't fish at all in 93 or we didn't fish at all this
- (13) year but we were ready to fish We were there
- (14) MR JAMIN Thank you Exxon lawyers may have some
- (15) questions
- (16) BY MR JAMIN
- (17) Q I'm going to ask one more question at the request of
- (18) Exxon Did you participate in the claims program in 1989?
- (19) A Yes sir I did
- (20) CROSS EXAMINATION OF L TOM DOOLEY
- (21) BY MR NEAL
- (22) Q I do have one question I guess Your herring fishing in
- (23) Prince William Sound in 1990 was terrific I guess
- (24) extraordinarily good in 1990?
- (25) A It was real good I wouldn't say terrific because I've had

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- (1) better but it was a real good year
 (2) Q How about 91 were you fishing there in 91?
 (3) A Yes sir
 (4) Q Wasn't the run really good size that year?
 (5) A I think it was fairly strong but what I'm referring to is
 (6) me personally Personally no sir I didn't do very well
 (7) Q Pardon me?
 (8) A For me personally I didn't do very well
 (9) Q But it had nothing to do with the run in 91?
 (10) A Well maybe it's the luck of my Irish or whatever
 (11) MR NEAL Thank you Mr Dooley - one more question
 (12) BY MR NEAL
 (13) Q How do you and your wife - do you all compete to see who
 (14) gets the largest number of fish?
 (15) A Yes sir we do but she usually wins
 (16) Q Ever a little lying done about that like it is where I go
 (17) fishing?
 (18) A Well she won't let me do that
 (19) MR JAMIN Despite the cross no redirect Your
 (20) Honor
 (21) THE COURT Thank you sir
 (22) MR GERRY If it please the Court the plaintiff will
 (23) call David Larson
 (24) THE CLERK Raise your right hand
 (25) (The Witness is Sworn)

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- (1) THE CLERK Please be seated For the record sir
 (2) state your full name your address and spell your last name
 (3) THE WITNESS My name is David C Larson
 (4) L a r s o n My address is 8076 Chinook Way in Blaine
 (5) Washington
 (6) DIRECT EXAMINATION OF DAVID C LARSON
 (7) BY MR GERRY
 (8) Q What do you do for a living Mr Larson?
 (9) A I'm a salmon seiner in Prince William Sound
 (10) Q How long have you been a fisherman?
 (11) A 38 years
 (12) Q When you started who did you start with?
 (13) A I started with my father I apologize He died last week
 (14) Q Did you come from -
 (15) A I apologize
 (16) Q You come from Montana sir?
 (17) A Yes sir I was born in Butte Montana
 (18) Q When did your dad start fishing?
 (19) A He began in the late 30s
 (20) Q In what area?
 (21) A He went to Cordova late 30s and Prince William Sound
 (22) Q You went there in 1956 then?
 (23) A Yes My father took me there in 1956
 (24) Q What kind of boat did he fish when you joined him?
 (25) A He fished in a small double ender in the Copper River Flats

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- (1) to begin with Had a one lung -
 (2) Q When did you get your own boat sir?
 (3) A I apologize again I got my first boat in the 70s
 (4) Q What kind of boat was it?
 (5) A It was about a 38 foot seiner
 (6) Q And how long did you have that particular boat?
 (7) A I had that one probably up into the late 70s
 (8) Q Did you replace it with another boat?
 (9) A Yes I did I bought a cannery boat
 (10) Q What's a cannery boat?
 (11) A Well they - in the old days the canneries owned most of
 (12) the boats and when they got - started to get rid of them I
 (13) bought one of them although I only had that boat for about a
 (14) year I sank it
 (15) Q What did you get then?
 (16) A Then I bought what they call a limit seiner a 58 foot
 (17) steel vessel I owned that for 9 years In 86 I also sank
 (18) that one
 (19) Q That one sank in 86?
 (20) A Yes
 (21) Q When you bought that boat did you pay cash for that?
 (22) A The first one?
 (23) Q No let's start with the limit seiner?
 (24) A No I didn't I financed that through Sea First
 (25) Q And when it sank had you paid off the loan?

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- (1) A Yes the insurance paid it off but I didn't make anything
 (2) on it Covered the boat
 (3) Q You replaced it with another boat?
 (4) A Yes I did 1987
 (5) Q What kind of boat did you get?
 (6) A Another limit seiner only this was an older wooden boat
 (7) Q Why is it called a limit seiner?
 (8) A Well in Alaska you're only allowed 58 feet for salmon
 (9) seining
 (10) Q That's the longest boat you can use for that purpose?
 (11) A Yes it is
 (12) Q Where during the course of your fishing have you fished?
 (13) Always in Prince William Sound?
 (14) A Always in Prince William Sound
 (15) Q When did you get your first limited entry permit?
 (16) A I earned it when they came out with former experience
 (17) Q This is a map of Prince William Sound?
 (18) A Chart
 (19) Q Chart I'm sorry I haven't gone to sea for a long time so
 (20) I get confused When you fished there the last - what area of
 (21) the sound did you fish in?
 (22) A I've spent probably 99 percent of my fishing career was
 (23) done in the southwest district
 (24) Q Is that that area down here?
 (25) A Yes it is Yes it is right inside that circle

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- (1) Q Were you fishing there in the 80s?
- (2) A Yes
- (3) Q You were fishing the limit seiner there?
- (4) A Yes I was
- (5) Q Where did you stand in the fishery as far as ranking of the fish?
- (6) A Well among individual processors you know among the overall picture the fishermen generally lie a little bit about that so you can't go by that but in the processors I was probably number one or number two of their fishermen
- (7) Q Which processor was that?
- (8) A Throughout the 80s it was Sea Hawk Seafoods in Valdez
- (9) Q And were your years of fishing improving or going downhill or were you making more money or less money in the 80s?
- (10) A Throughout the 80s we were doing better every year
- (11) Q Then 1989 the spill came along is that right?
- (12) A Yes it did
- (13) Q Did the spill oil most of the area that you had been fishing in?
- (14) A Yes
- (15) Q Were you able to fish that year?
- (16) A No we weren't
- (17) Q Did you however fish during that year?
- (18) A In 89?
- (19) Q Yes

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- (1) A Yes we did fish but we were just allowed a small portion of the northern district which I'd never fished before
- (2) Q Northern district is the district up here in these lines?
- (3) A No up higher That island to the right of your finger
- (4) Q Esther Island?
- (5) A No keep going right in the middle of the chart That's Glacier Island Behind that was the approximate area where they allowed us to fish
- (6) Q All right As a result of the fact that the boats coming out of the area that you had fished and other oiled areas were there a lot of fish?
- (7) A (Indicating)
- (8) Q Were there a lot of boats?
- (9) A There was an awful lot of boats there probably a hundred of them
- (10) Q Did you ever fish there before?
- (11) A No
- (12) Q Were you familiar with that area at all?
- (13) A I've run through there but I never spent much time fishing that area
- (14) Q How did you do there?
- (15) A Not very well
- (16) Q After the 1989 season did you continue to fish in Prince William Sound?
- (17) A Yes did I

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- (1) Q Where did you fish?
- (2) A We were allowed to fish some of the southwest districts and they had other openings but the areas that were open were what they call hatchery terminal areas
- (3) Q What's the difference between a hatchery terminal area and the other fishing area where you had been fishing?
- (4) A Well aside from the small area that it's contained in all you do is intercept fish that are headed for the hatchery it's a very small area three or four five six points where all boats have to fish and they are generally in line with anywhere from 15 to 30 boats taking turns
- (5) Q Does that then concentrate the fish all to one area around the hatchery?
- (6) A Yes
- (7) Q Did it result in catching fish that were lesser quality than the fish you were catching before?
- (8) A Yeah the nearer you get to a stream or hatchery the worse the quality is
- (9) Q So what do you call a fish that you catch out in the deep water bright?
- (10) A Yeah ocean run fish are bright That's the ideal fish
- (11) Q As they get closer they got poorer qualities?
- (12) A Longer they spend on the inside water or the closer they get to fresh water they deteriorate Actually they are deteriorating the minute they come in from the ocean

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- (1) Q However you caught fish in 90 and 91 didn't you?
- (2) A Yes I did
- (3) Q Caught quite a few fish?
- (4) A Yes
- (5) Q Was that a good year for you?
- (6) A Monetarily wise no very poor
- (7) Q Then you fished 92?
- (8) A Yes
- (9) Q Good year or bad?
- (10) A Poor
- (11) Q How about 93?
- (12) A Worse
- (13) Q Are you going to fish this year?
- (14) A I'm not The way it looks the herring have already failed and they are not sure about the hatchery fish so it would probably be just like last year a complete failure So I doubt if I'll fish
- (15) Q Did you make money or lose money?
- (16) A No I went in the hole
- (17) MR GERRY Thank you
- (18) CROSS EXAMINATION OF DAVID C LARSON
- (19) BY MR SERDAHELY
- (20) Q Good afternoon Mr Larson I'm Doug Serdahely with the Exxon defendants Just one question in 1989 did you participate in the Exxon claims program?

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- (1) A Yes I did
 (2) MR GERRY Nothing further Your Honor
 (3) THE COURT Thank you sir You may step down
 (4) MR O NEILL Plaintiffs call Ken Parker
 (5) THE CLERK Raise your right hand please
 (6) (The Witness Is Sworn)
 (7) THE CLERK Please be seated For the record sir
 (8) state your full name your address and spell your last name
 (9) please
 (10) THE WITNESS Kenneth Paul Parker I live at 4440
 (11) Columbia Boulevard in Juneau Alaska And my last name is
 (12) P a r k - e r
 (13) DIRECT EXAMINATION OF KENNETH P PARKER
 (14) BY MR O NEILL
 (15) Q How old are you sir?
 (16) A 50
 (17) Q And are you married?
 (18) A Yes I am
 (19) Q To whom?
 (20) A Lynette
 (21) Q And do you have any kids?
 (22) A Yes I have three
 (23) Q And where do you reside?
 (24) A In Juneau Alaska
 (25) Q How long have you lived in Juneau?

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- (1) A 14 years now
 (2) Q When did you come to Alaska?
 (3) A I came up here originally with my mother in 1960 and I
 (4) lived here off and on for a while and started college up at the
 (5) University of Alaska
 (6) Q And at some point in time did you finish college?
 (7) A Yes I did
 (8) Q Where did you finish college?
 (9) A Down in Southern California at the University of - San
 (10) Diego State University
 (11) Q What was your degree in?
 (12) A It was - I have two degrees bachelor of science in
 (13) zoology and a masters in science and biology
 (14) Q And where did you get the masters in biology?
 (15) A At San Diego State University
 (16) Q When did you receive that degree?
 (17) A In 72
 (18) Q And what courses did you take?
 (19) A I took courses in general biology ichthyology statistics
 (20) marine ecology and other general biological courses
 (21) Q And at some point in time did you decide to go to work and
 (22) make an honest living or one or the other or both?
 (23) A People around me forced me to do that I came back
 (24) returned to Alaska after I graduated from college
 (25) Q What job did you take?

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- (1) A Well I started off I got a temporary job with the State
 (2) of Alaska Department of Fish & Game
 (3) Q Doing what?
 (4) A I was a temporary biologist research biologist
 (5) Q And if you could go through your job history after that for
 (6) us and bring us up to date what kind of things did you do
 (7) what jobs did you have?
 (8) A Well I started off in a temporary position and worked
 (9) that for just a few months then I was promoted into a
 (10) permanent full time position and I worked in that position for
 (11) two years then I was promoted into the research project leader
 (12) for Bristol Bay at a research position I was involved in the
 (13) season management activities assessment of run strength to the
 (14) Bristol Bay sockeye fisheries I ran field camps and collected
 (15) data and had to analyze the data and determine the size of the
 (16) runs I was also responsible for post season compilation of
 (17) catch and escapement for Bristol Bay and another
 (18) responsibility to generate the annual preseason forecast for
 (19) the Bristol Bay salmon fisheries
 (20) Q Then what did you do?
 (21) A Subsequent to my six years in Bristol Bay research I moved
 (22) into deputy director position in Juneau for the Division of
 (23) Commercial Fisheries and held that position for six years and
 (24) then I was later promoted into the director position for the
 (25) division and I retained that for six years and then I retired

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- (1) in 19 - in October 31st 1990
 (2) Q You were both a deputy director and the director of
 (3) Commercial Fisheries for who?
 (4) A For the State of Alaska
 (5) Q And that s the Alaska Department of Fish & Game?
 (6) A Yes that s correct
 (7) Q Have you ever done any service with regard to the North
 (8) Pacific Fisheries Commission?
 (9) A Yes I served on the North Pacific Fisheries Commission as
 (10) a - you mean North Pacific Fisheries Management Council?
 (11) Q Yes
 (12) A I served as the alternate commissioner
 (13) Q In your years as the director and deputy director of Fish &
 (14) Game did you have any responsibility for implementation of
 (15) Fish & Game s regulatory management s programs?
 (16) A Yes as both deputy and director I was responsible for the
 (17) inseason management program throughout the state on all
 (18) species
 (19) that the State of Alaska had regulatory authority for The
 (20) responsibility is kind of cyclic in nature In season we would
 (21) spend a lot of time out in the fisheries Preseason we would
 (22) be involved in planning activities In the winter we would be
 (23) working with the Alaska Board of Fisheries to develop a
 (24) regulatory framework that would be used to manage these
 (25) fisheries
 (25) Q In your years with Fish & Game have you ever been involved

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(1) in forecasting harvest strategies methods of fish counting and
 (2) run reconstruction?
 (3) A Yeah pretty much throughout my career I lived and breathed
 (4) fisheries and we had - I had direct responsibilities when I
 (5) was in Bristol Bay for forecasts and then reconstruction and
 (6) then later as deputy and director I was involved in working
 (7) with the staff at all levels on anywhere from a daily basis to
 (8) a weekly basis involved in figuring out what s going on with
 (9) the salmon and trying to figure out how we could do a better
 (10) job of forecasting and putting the numbers back together
 (11) Q Have you ever had any field experience with regard to the
 (12) collection and analyzing of any field data on run size catch
 (13) escapement of salmon?
 (14) A Yes During my years in Bristol Bay I had direct
 (15) responsibilities for that sort of thing and as deputy during
 (16) the field season I was out working with our area biologists in
 (17) the field periodically Not all the time but periodically
 (18) and oversaw data collection activities and analysis and
 (19) interacted with my biologists to see what they were doing
 (20) MR O NEILL We would offer Mr Parker as an expert
 (21) witness on the subjects of Alaska commercial salmon fisheries
 (22) and run size estimation with regard to commercial salmon
 (23) fisheries in the State of Alaska
 (24) MR LYNCH I have no problem with the second of the
 (25) two subjects The first is awfully broad and seems to -

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(1) anything I know about but assuming it s in the same frame
 (2) we re talking about I have no problem with it
 (3) THE COURT Court will accept Mr Parker s
 (4) qualifications as someone expert in reconstructing runs and
 (5) forecasting
 (6) MR O NEILL Thank you Judge
 (7) BY MR O NEILL
 (8) Q You were the director of commercial fisheries the year of
 (9) the oil spill?
 (10) A Yes that s correct
 (11) Q I m going to go through a series of exhibits and for the
 (12) record they have all been preadmitted and I ll read them off
 (13) but I m only going to use preadmitted exhibits
 (14) The first one is Exhibit 282
 (15) MR LYNCH Could you use PX for the record?
 (16) BY MR O NEILL
 (17) Q PX 282 what is PX 282?
 (18) A This exhibit shows the State of Alaska with the
 (19) administrative and management regions that the Alaska
 (20) Department of Fish & Game uses for the state s fisheries My
 (21) pointer doesn t seem to be working
 (22) Q It should You got to get close to the screen but not on
 (23) the screen
 (24) A Got you We have four regions We have the state divided
 (25) into essentially four regions The southeast and Yakutat

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(1) region is referred to as our region one and of course it
 (2) involves the fisheries from Yakutat to Juneau on up to - from
 (3) Yakutat Juneau to Ketchikan The central region includes the
 (4) Prince William Sound Upper and Lower Cook Inlet and Bristol
 (5) Bay Westward region includes the fisheries around the Kodiak
 (6) Island on the south side of the Alaska Peninsula Chignik and
 (7) the Alaska Peninsula Aleutian Island fisheries and the
 (8) westward region includes management regions for the shellfish
 (9) fisheries for the Bering Sea The last region is the Arctic
 (10) Yukon Kuskokwim called AYK for short involves the fisheries
 (11) of the Kuskokwim region the Yukon Delta and River Norton
 (12) Sound and Kotzebue Sound fisheries
 (13) Q I m going to ask what may be a dumb question but that s
 (14) not stopped me before Why do you have these regions?
 (15) A Well it just provides administrative breakdown for one
 (16) thing and also we have regional staff in each region that
 (17) concentrate on management of the fisheries within that region
 (18) as opposed to having one of us be responsible for the entire
 (19) state We have a very diverse selection of fisheries in our
 (20) state and you would be asking quite a bit to have one office
 (21) control everything
 (22) Q And this is by way of background but if you would explain
 (23) to us briefly how do you manage a commercial fishery?
 (24) A Well of course it depends on the species that you re
 (25) managing

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(1) Q Let s take a salmon fishery
 (2) A Salmon fishery basically what you re trying to do is a
 (3) balancing act between your harvest and what you need for your
 (4) broad stock your escapement the fish that are allowed to go
 (5) up into the stream to spawn and for most salmon streams we
 (6) have found there is an optimum number of spawners that do the
 (7) best in a particular stream if you get too many you don t do
 (8) quite as well the fish stocks may decline a little bit
 (9) Likewise if you have too few the same thing can happen so
 (10) it s a balancing act
 (11) We have these areas divided up into districts and you ve
 (12) already seen some of that information in earlier presentations
 (13) and the manager within that management area like Prince
 (14) William
 (15) Sound has to allow harvests to occur kind of in a balanced
 (16) format within those districts such that he can balance what
 (17) he s getting in the commercial catch or harvest along with
 (18) what gets into the streams for spawning escapement
 (19) Q Let s take you want enough fish to get up stream to have
 (20) fish in the future and that s the first priority and the
 (21) second priority to the extent you can do that you want to
 (22) have a commercial catch so you have a healthy commercial
 (23) fishery?
 (24) A That s correct We have management plans that are
 (25) provided
 (26) by the Alaska Board of Fisheries It s a lay group appointed
 (27) by the governor that makes decisions on allocation of these

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- (1) fish resources for competing groups sportfishermen
 (2) setnetters drift gillnetters seiners all kinds of
 (3) divisions So the managers have this game plan that they have
 (4) to abide by in most situations that provides guidance on
 (5) allocation of the surplus once they have identified it to these
 (6) various competing users
 (7) Now this whole exercise would be pretty good if salmon were
 (8) cattle and you could stand up on a hillside and count them
 (9) visually but you can't The only time you get to see them is
 (10) when they get in a stream or in a commercial catch
 (11) Q With regard to a manager of a fishery Upper Cook Inlet
 (12) fishery Prince William Sound Kodiak Chignik fishery during
 (13) the course of a season what kind of information does the
 (14) manager have available to him or her to manage that fishery?
 (15) A The information kind of starts even before the season when
 (16) a forecast is prepared The manager looks at that forecast and
 (17) he's intimidated by that he sees - he expects a few fish or
 (18) normal or very large run so that kind of sets the stage
 (19) Then he's going to be looking in season he's going to be
 (20) using his commercial catch as a gauge you know how well the
 (21) fishery is doing relative to the amount of time they are
 (22) fishing and he's always got his escapement enumeration
 (23) projects and they may vary from a test fish program at the
 (24) mouth of a major river system they may be a sonar program
 (25) within the river or it may be aerial surveys over the stream

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- (1) beds where a biologist actually tries to count the salmon that
 (2) are spawning
 (3) Q What fisheries and everybody knows this but nobody has
 (4) been asked this what fisheries were impacted by the 1989
 Exxon
 (5) Valdez oil spill?
 (6) A Well there was a number of fisheries in the central region
 (7) and westward region that were impacted We have some
 exhibits
 (8) that list those You might want to -
 (9) Q Well let's go through the maps if we could I'm going to
 (10) bring up Plaintiffs Exhibit 303 and what is Plaintiffs
 (11) Exhibit 303?
 (12) A This is an illustration of the Prince William Sound
 (13) management area with the 11 districts within the management
 (14) area indicated and of course we did have a number of fishery
 (15) closures within Prince William Sound The major portion of the
 (16) Montague district was closed the entire southwestern district
 (17) was closed The Eshamy district was closed and portions of
 (18) the northern district were closed and the entire district was
 (19) closed for 11 days during the peak of the run later on in the
 (20) summer
 (21) Q And why was the district closed why were these portions of
 (22) the district closed?
 (23) A Due to problems with oil from the Exxon Valdez
 (24) Now I've been referring to just salmon fisheries
 (25) Q How about herring fisheries?

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- (1) A There were closures on our spring herring fisheries and
 (2) they take place in various locations throughout the Sound but
 (3) basically all the herring fisheries there are four they were
 (4) closed The sac roe fishery it's a fishery on the herring
 (5) eggs They harvest the herring so you can extract the egg We
 (6) have fisheries on roe on kelp both in pounds which are net
 (7) enclosures that float in the water and then we have the wild
 (8) kelp fisheries where divers go out into the fisheries where
 (9) kelp has the eggs deposited on the blades and then we also
 (10) have a gillnet fishery that harvests sac roe So we have both
 (11) gillnet and purse seine harvesting sac roe
 (12) Q With regard to the four different types of herring that
 (13) were harvested in Prince William Sound were all four of those
 (14) types closed?
 (15) A Yes they were
 (16) Q Who would eat fish eggs on kelp?
 (17) A I do after it's been processed
 (18) Q I might pass on that
 (19) I'd like to if I could go to Plaintiff's Exhibit 305
 (20) What is Plaintiff's Exhibit 305?
 (21) A This illustrates the Kodiak area management The Kodiak
 (22) management area with the district surrounding the Kodiak
 Island
 (23) including the mainland district along the Alaska Peninsula
 (24) Q Were there closures in Kodiak as a result of the 1989 Exxon
 (25) Valdez oil spill?

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- (1) A Yes there was
 (2) Q And generally where were they?
 (3) A Well there was major closures in the sac roe fishery in
 (4) the spring I think most of the management areas management
 (5) districts were closed There was some openings The salmon
 (6) fishery was pretty much limited to a setnet fishery in the
 (7) Alitak Bay region There was some short openings for the
 (8) seiners in Karluk this area but for the most part the rest
 (9) of the island was closed to the salmon fisheries
 (10) Q And why were the fisheries closed?
 (11) A It was due to the presence of oil
 (12) Q I'm going to bring up Plaintiffs Exhibit PX 304 What is
 (13) PX 304?
 (14) A This is a map a chart of the Upper Cook Inlet management
 (15) area showing the central district along in through here and
 (16) then the northern district of Upper Cook Inlet
 (17) Q In 1989 were there any fishing closures in the Upper Cook
 (18) Inlet salmon district?
 (19) A Yes in the salmon fishery we ended up having to close
 (20) down the drift fishery that is prosecuted in the upper
 (21) subdistrict of the central district and we had a 12 hour
 (22) closure on the east side setnet beach south of the Kasilof
 (23) River right in this area here
 (24) Q I'm going to bring up Plaintiffs Exhibit 306 PX 306 and
 (25) ask you what it is?

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- (1) A This is a chart again of the Chignik management area
 (2) showing the districts within that management area Perryville
 (3) western central and eastern and then the Chignik Bay
 (4) district in here and this is the - this pointer doesn't want
 (5) to cooperate anyway It also shows Chignik Lake right here
 (6) and Black Lake which are the major sockeye producers for that
 (7) area
 (8) Q Were there oil spill related closures with regard to the
 (9) Chignik fishery?
 (10) A Yes there was I believe without looking at the detailed
 (11) documents most of it was on the outside and restricted fishing
 (12) on the outside coast
 (13) Q What is Plaintiffs Exhibit 304 A when it comes on the
 (14) screen?
 (15) A This shows the Lower Cook Inlet management area Again
 (16) here is Anchorage - I mean Homer for reference and this is
 (17) the dividing line here between Lower Cook Inlet and the Upper
 (18) Cook Inlet management area that we saw before and the
 (19) management area includes the eastern outer districts the
 (20) Barren Island and southern districts and Kamishak districts
 (21) Q Were there any oil impacts with regard to the Lower Cook
 (22) Inlet management area?
 (23) A Yes there was closures in the outer and eastern districts
 (24) and within the Kamishak district
 (25) Q I'd like to if we could go to Prince William Sound and

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- (1) talk for a minute about the timing of the spill versus the
 (2) opening of the 1989 herring season Could you tell us about
 (3) that?
 (4) A You know the spill of course occurred in late April and
 (5) our herring fisheries -
 (6) Q Late March?
 (7) A I'm sorry late March and our herring fisheries in Prince
 (8) William Sound are run anywhere from early April through late
 (9) April So we were of course facing the beginning of our
 (10) herring fisheries almost immediately after the spill had begun
 (11) Q Did the herring fisheries open?
 (12) A No We summarily closed all of them
 (13) Q Now I want to talk generally about something called the
 (14) zero tolerance policy and a memorandum of understanding
 (15) concerning the zero tolerance policy and I'm going to place in
 (16) front of you Plaintiffs Exhibits 274 and 279 which are in
 (17) evidence What was the zero tolerance policy?
 (18) A Well the zero tolerance was a term that was coined during
 (19) the early development of this memorandum of understanding
 (20) and it related to how the department was going to manage the
 (21) fisheries in view of the oil potentially interfering with it
 (22) the normal prosecution of fisheries The final product out of
 (23) discussions at the area level and at headquarters and at
 (24) throughout the state with our managers and people in the
 (25) industry was that we developed this memorandum of

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- (1) understanding which is an agreement essentially between two
 (2) state agencies the DEC and the Alaska Department of Fish &
 (3) Game and it basically lines out who is going to be responsible
 (4) for what kind of actions and how we're going to proceed It
 (5) was a document that also provided information to the industry
 (6) on what to expect from the state
 (7) Q What was the problem that presented itself? Why did you
 (8) need to have a memorandum of understanding? As a practical
 (9) matter what issue are we addressing?
 (10) A Well we had a tremendous problem facing management with
 (11) the presence of the oil and there was no way in some
 (12) situations that we could prosecute a normal fishery so
 (13) something had to be done We needed guidance out there for
 (14) our
 (15) area managers to follow so that they would know when to close
 (16) you know how to close how to proceed
 (17) Q Now is that referred to as the zero tolerance policy? Did
 (18) it stay a zero tolerance policy?
 (19) A No not really It was a name that caught on and it's
 (20) often referred to as the zero tolerance but actually the
 (21) important point is that this document spelled out when the
 (22) department would close fisheries would react to oil and
 (23) within the document we have the terminology appreciable
 (24) likelihood and that is used in the document to kind of guide
 (25) when the departments would take action When we perceived
 that
 there is a likelihood that gear will be fouled fish harvested

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- (1) adulterated by the oil or the conduct of an orderly fishery
 (2) could not take place basically what we're saying is if we
 (3) perceive a problem a likelihood to measure a likelihood of
 (4) something happening we would have to react to close these
 (5) fisheries down and that was the basically the concept in the
 (6) MOU
 (7) Q So if there was an intersection between oil and fish and
 (8) that created a likelihood of a problem with oiled fish or oiled
 (9) gear then the department had to take some regulatory action?
 (10) A That's correct
 (11) Q In the development of this policy was Exxon Corporation or
 (12) their representatives invited to participate in that
 (13) development?
 (14) A Yeah there was a number of meetings that occurred in the
 (15) Cordova area and it's my understanding that they were invited
 (16) to participate in those proceedings
 (17) Q And Exxon has stated in its opening here that it agrees
 (18) generally with the zero tolerance policy Were there any
 (19) criticisms of the zero tolerance policy by Exxon to you as the
 (20) director of the fisheries?
 (21) A No not that I can recall
 (22) Q Now we talked generally with the closures using the maps
 (23) I am now going to ask you some more detailed questions about
 (24) the closures using Plaintiffs Exhibit 283 it's PX 283 What
 (25) is - let's get it so we can read it

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- (1) What is PX 283?
- (2) **A** This is a listing of the specific closures that occurred as a result of the 1989 season from the spill
- (3) **Q** Would you generally go over the first page of PX 283?
- (4) **A** Certainly This lists the closures that took place in Prince William Sound and the first one is the pacific herring fisheries and we did close the gillnet and purse seine sac roe fisheries along with the pound wild roe on kelp April 3
- (5) The next fishery was the shrimp fishery It was in progress at the time We closed that down April 3rd and we had also a trawl shrimp fishery we closed April 9th And this lists also the closures that occurred in 90 in 1990 and we had a small spot shrimp harvest that usually occurs around Knight and Eleanors and we closed that for the 1990 season
- (6) We had blackfish I mean sablefish fishery that closed April 1st and it did reopen later with the halibut opening
- (7) Dungeness crab we closed April 30th for the season King crab we also closed October 1st and groundfish and closed April 30th and re opened along with the halibut opening in mid June We had miscellaneous shellfish we closed on April 24th and we basically didn't issue any permits in that fishery And the pink chum and sockeye fisheries we closed as I indicated before the Eshamy district portions of the northern district and all the northern district for 11 days
- (8) We closed the southwestern district and parts of the

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- (1) Montague Island district In 1990 we had some area right around Eshamy Bay that were closed for just a few days and then re opened and there was portions on the LaTouche Island around
- (2) Eleanor and Ingot that were closed to fishing for that season
- (3) **Q** Would you do the same drill with regard to page two of Plaintiffs 283?
- (4) **A** Certainly This lists the Upper Cook Inlet fishery and of course we have the sockeye salmon fishery
- (5) **Q** Sir could you just hold on for a minute? Sorry to interrupt you Let me get this so we can read it
- (6) MR LYNCH Thank you
- (7) BY MR O NEILL
- (8) **Q** Start at the top again
- (9) **A** Have the Upper Cook Inlet fishery and that's the sockeye fishery I was referring to before We closed the central district drift fleet and a portion of the beach on the south of the Kasilof River for a 12 hour period The rest of the central district drift fishery was closed
- (10) In Lower Cook Inlet we had a shrimp fishery that was closed April 30 and opened it July 7th We had miscellaneous shellfish fishery that closed on the 24th of April and the outer and eastern districts and the groundfish fishery that we also closed in the outer and eastern districts and they were closed April 30th The fishery did reopen for all species except sablefish on June 12th in conjunction with the halibut

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- (1) opening
- (2) Smelt remained closed with groundfish in the outer and eastern districts beginning April 30th Pacific herring we had the sac roe fishing in the outer and eastern districts closed
- (3) April 15th prior to the regular opening date Pink salmon fishery we had the same fishery in Kamishak Bay that opened and
- (4) closed by emergency order We did have some areas that remained open in the Kamishak district and the Tutka Bay subdistrict north of a particular point probably get into this when you get into Lower Cook Inlet They were closed to seining on July 10th
- (5) **Q** What do we have on the third page of Plaintiffs Exhibit 283?
- (6) **A** This is the same general information for the Kodiak fisheries We have the pacific herring fisheries and approximately 34 of the 56 management units were closed for the duration of the sac roe season
- (7) **Q** I'm going to try to pull it up again
- (8) **A** That's better The sockeye and pink fishery As we indicated the setnet fishery in the Alitak district was open but that was pretty much it The other fisheries were very limited We did have a two-day seine opening in the Kariuk Lagoon on the west side of Kodiak Island in mid September but the rest of the Kodiak management area was closed to commercial
- (9) salmon fishing

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- (1) Chignik is indicated here and it's a sockeye fishery and the fishery - the outer portions the eastern were closed due to the presence of oil and we did have some closures in the Chignik Bay district for a little bit of time and the fishery was restricted to the inner parts of Chignik Bay
- (2) **Q** And with regard to all of the closures in PX 283 why did these closures occur?
- (3) **A** They were implemented in response to our MOU that spelled out you know how we would handle the presence of oil in our salmon fisheries and well all of our fisheries and how we would react
- (4) **Q** And that MOU was a result of the Exxon Valdez oil spill?
- (5) **A** Yes
- (6) **Q** Did you visit Prince William Sound after the spill?
- (7) **A** Yes I did
- (8) **Q** And when was that?
- (9) **A** That was one week after the beginning of the spill
- (10) **Q** And tell me about it?
- (11) **A** Well I flew into work with our managers and assess what was going on and see for myself firsthand the magnitude of the problem and begin activities to design research activities that we would implement to assess the spill's impact on our fisheries
- (12) **Q** What did you see?
- (13) **A** Well I flew over Prince William Sound and inspected the

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- (1) Exxon Valdez on Bligh Reef and then I flew towards the
 (2) southwest corner over the spill area. Pretty much spread all
 (3) the way to the outlet of Prince William Sound in that corner
 (4) We don't have a map. Maybe put up that map of Prince William
 (5) Sound.
 (6) Q Sure. I'm going to put up on the screen Plaintiffs
 (7) Exhibit 303. Now using the map, tell us what you saw?
 (8) A Well, I flew into Cordova, then took a light airplane to
 (9) survey the situation. We flew up here to Bligh Reef and around
 (10) the Exxon Valdez and I observed oil moving throughout this
 (11) area and down through here. We flew in a southwesterly
 (12) fashion
 (13) through this area (indicating) and through these - I observed
 (14) the oil existing through these passes and we flew over to the
 (15) AFK hatchery that's located on San Juan Island and
 (16) observed the booms and the activities there and then we
 (17) swung
 (18) back up here and took a look at this area by Eshamy and then
 (19) back to Cordova.
 (20) Q Where are the principal salmon spawning streams in Prince
 (21) William Sound?
 (22) A Well, we have 1100 spawning streams within Prince William
 (23) Sound and they are pretty much spread throughout the
 (24) periphery
 (25) of the Sound and the larger islands and you know fairly well
 (26) distributed
 (27) Q Distributed throughout the Sound?
 (28) A Yes

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- (1) MR O NEILL I'm going to change subjects. Judge is
 (2) that close enough?
 (3) THE COURT Yes, sir. We'll adjourn now, ladies and
 (4) gentlemen. Please remember my instructions about not
 (5) listening
 (6) to or reading anything about our case. We will reconvene at
 (7) 8:00 in the morning. We're adjourned until that time.
 (8) MR O NEILL Thank you, Judge.
 (9) (Proceedings recessed at 2:00 p.m.)

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- (1) STATE OF ALASKA)
- (2) Reporter s Certificate
- (3) DISTRICT OF ALASKA)
- (6) I Leonard J DiPaolo a Registered Professional
- (7) Reporter and Notary Public
- (8) DO HERBY CERTIFY
- (9) That the foregoing transcript contains a true and
- (10) accurate transcription of my shorthand notes of all requested
- (11) matters held in the foregoing captioned case
- (12) Further that the transcript was prepared by me
- (13) or under my direction
- (14) DATED this day
- (15) of 1994
- (21) LEONARD J DiPAOLO RPR
Notary Public for Alaska
- (22) My Commission Expires 2 3 96

Look-See Concordance Report

UNIQUE WORDS 3,393
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14 421
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TOTAL WORDS IN FILE
42,584

SINGLE FILE CONCORDANCE

CASE SENSITIVE

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(1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 In re) Case No A89-0095 CIV (HRH)
 (5)) Anchorage Alaska
 The EXXON VALDEZ) Wednesday June 22 1994
 (6)) 8 00 a m
 TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY 31st DAY
 BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE
 (12) VOLUME 27, Pages 4507 4716
 Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 8 00 a m)
 (3) THE CLERK All rise
 (4) (Call to Order of the Court)
 (5) THE COURT Good morning ladies and gentlemen This
 (6) is the continuation of trial in Case A89-0095 civil in re the
 (7) Exxon Valdez Let s see where are we?
 (8) Mr Parker you understand you re still under oath?
 (9) THE WITNESS Yes Your Honor
 (10) THE COURT Mr O Neill you may continue
 (11) MR O NEILL Thank you
 (12) CONTINUED DIRECT EXAMINATION OF KENNETH P
 PARKER
 (13) BY MR O NEILL
 (14) Q How are you sir?
 (15) A Just fine
 (16) Q I have in front of you plaintiffs Exhibit 303 which is
 (17) the map of the Prince William Sound management area It s on
 (18) the screen And if you would would you show us the path that
 (19) the pink salmon in the Sound normally take when they return to
 (20) their spawning streams?
 (21) A Certainly Well the pink salmon pink and chum salmon
 (22) rear in the Gulf of Alaska and the north Pacific and then on
 (23) their adult - when they begin to mature as adults they start
 (24) their annual migration back to the stream of origin and what
 (25) they do during this migration of course is pick up the scent

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(1) of their home stream or the general area where they were
 (2) born So we know that the general /ES sick (ck) pattern of
 (3) currents out of Prince William Sound is through the
 (4) southwestern corner so the vast majorities of the fish as
 (5) they return from the open ocean come in through these passes
 (6) come through the southwestern district and portions of the
 (7) Montague district on their way - eventually on up into the
 (8) individual bays and streams and fjords where they were
 (9) originally from
 (10) Q You mentioned the zero tolerance policy yesterday Was the
 (11) zero tolerance policy also in effect in 1990?
 (12) A Yes It was changed It was a different policy but
 (13) basically the same provisions held that perceivable or
 (14) appreciable likelihood clause was still in there that language
 (15) held
 (16) The policy did recognize that time had passed since the
 (17) original spill and there were some certain changes that were
 (18) likely to occur during that season but for the most part, the
 (19) policy still said that there s an appreciable likelihood of oil
 (20) fouling gear or contaminating fish that the fishery should be
 (21) closed
 (22) Q Would you describe for us if you would using Exhibit -
 (23) Plaintiffs Exhibit 289 the commercial catch by species in
 (24) Prince William Sound Alaska?
 (25) A Certainly This histogram illustrates the commercial catch

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- (1) by species for the years 1979 through 1992 and the axis here
 (2) is the actual commercial catch in actually thousands so this
 (3) first indication would be five million The average catch of
 (4) all species combined for this period up to 1988 was about 22
 (5) and a half million salmon
 (6) You can see from inspection of this chart that the vast
 (7) majority and I think it's about 93 percent of the harvest is
 (8) actually pink salmon That's followed by chum salmon and
 that
 (9) represents a little bit less than five percent of the total
 (10) harvest during this time period
 (11) Okay That's followed by sockeye which is slightly under
 (12) two percent of the total catch and that's followed by coho
 (13) which is less than one percent and then the chinook catch is
 (14) less than about one-tenth of a percent So that will give you
 (15) a relative idea of the magnitude of the species as they occur
 (16) in the commercial catch
 (17) Q Would it be fair to say that the Prince William Sound
 (18) fishery is primarily a pink salmon fishery?
 (19) A Yes that's correct Although for certain gear types
 (20) these other species are very important particularly sockeye
 (21) Q I'd like you to explain to us if you could the whys and
 (22) hows of Fish & Game's management of the Prince William
 Sound
 (23) salmon fishery
 (24) A Well of course what we're attempting to do in any salmon
 (25) fishery is to balance the need for a certain level of

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- (1) escapement in these individual streams versus the need to crop
 (2) off the surplus to harvest them to let them either go into
 (3) the common property fishery or into the hatchery sales
 (4) harvest And of course the hatcheries also need a certain
 (5) level of escapement to continue their operations so the
 (6) manager is faced with a difficult situation of having to
 (7) balance harvest versus catch (ck) And he has certain
 (8) techniques available to him to accomplish this
 (9) One of course is the commercial catch It's very
 (10) important to the manager He has to be able to send that fleet
 (11) out It's the best way to sample a district, to find out
 (12) what's there to allow that fleet to go out there and have a
 (13) short period see what they catch
 (14) We've got an extensive data base over the years that's been
 (15) collected for all our fisheries in Alaska that lays out for the
 (16) manager the historical catch patterns by district and even
 (17) subdistrict so that you can look at a catch that happens that
 (18) time of year and compare it to past years and get a relative
 (19) idea of the strength Okay
 (20) In addition to the catch he's got escapement to give him
 (21) kind of a - some feeling for how that escapement is developing
 (22) and also the run But as we know the escapement is an index
 (23) program We don't have the - we've never had the funds in
 (24) Alaska to survey all of our streams so we have to divide and
 (25) conquer if you will We have a certain number of streams that

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- (1) we set up that we look at every year and we look at it as
 (2) frequently as we can afford to look at them and that gives us
 (3) a relative index that we can compare year to year on how well
 (4) those streams are - the escapements in those streams are
 (5) developing
 (6) Q Did the oil spill in 1989 have any impact on the management
 (7) of the Prince William Sound fishery?
 (8) A Well the - probably the most major impact was the
 (9) elimination of the ability to fish in the southwestern
 (10) district - well essentially the southwestern corner of
 (11) Prince William Sound where all these fish are migrating into
 (12) Prince William Sound The Montague district and the
 (13) southwestern district are down in that corner along with the
 (14) Eshamy district They were closed for the season Even up in
 (15) the northern part of Prince William Sound or where the
 (16) northern district is a portion of that was closed to protect
 (17) it from potential oil/fish interaction So essentially this
 (18) upper part was the portion that was open and furthermore
 (19) during the peak of the season from I believe it is the end of
 (20) July to about the end of the first week of August this whole
 (21) district was closed due to an oil incident
 (22) So to back up here this part was closed so the managers
 (23) were forced into a situation where they had to rely on how the
 (24) escapements were developing in these areas to assess the run
 (25) They didn't have the ability to put that fleet out there and

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- (1) see what the catch per unit effort might have been during an
 (2) opening
 (3) In normal years in normal years this district
 (4) southwestern district -
 (5) Q We'll bring it back up for you
 (6) A - accounts for over half of the commercial salmon pink
 (7) salmon catch in the purse seine fishery over half So that
 (8) opportunity was gone
 (9) Q Now how do you count fish?
 (10) A Well in most pink and chum fisheries throughout the state
 (11) we use a program of aerial surveys It's the backbone of the
 (12) Prince William Sound program as well That's where our
 (13) biologist flies in a small single engine airplane with a
 (14) pilot and they fly over these streams and visually count the
 (15) number of salmon that they can see within the stream And as
 (16) you can expect the success is variable depending upon the
 (17) light conditions that you have the wind conditions the tree
 (18) coverage over the - you know the forest canopy that may
 (19) interfere with seeing parts of that stream So the backbone is
 (20) really the aerial survey And the plane is flying along
 (21) anywhere from 75 miles per hour to 110 miles per hour
 (22) Now we often use ground surveys in addition to the aerial
 (23) surveys That's where if a surveyor was questioned what the
 (24) species composition was of the fish that he was seeing in the
 (25) stream they will oftentimes land get out walk the banks of

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- (1) the stream and visually try to get a - a better feeling about
 (2) the species composition because you do have pink and chums
 (3) that are using the same stream beds for spawning So they get
 (4) out and get an idea about that to help them develop these
 (5) estimates of the number of spawners in the stream
 (6) Q What is Plaintiffs Exhibit Number 3017
 (7) A Well this is just a summary of what aerial surveys do
 (8) provide And in the case of Prince William Sound we see that
 (9) we re indexing We have index streams Those are the ones
 (10) that are surveyed every year in a very regular basis and
 (11) actually in Prince William Sound they survey them once a week
 (12) is the normal program It takes four days to accomplish the
 (13) survey of all these 209 streams with one observer and one
 (14) pilot
 (15) So we re actually looking at 209 streams out of the 1100
 (16) streams so these observations these surveys provide
 (17) observations of select groups of pink/chum salmon spawning
 (18) streams thought to be representative of the area called index
 (19) streams
 (20) Counts seen by the observers they look at the bays first
 (21) to see the build up of fish in the bays They look at the
 (22) mouth of the stream and then last they look at the fish that
 (23) are actually in the stream Of course the fish that are in the
 (24) stream is actually the ones that they use for the index
 (25) program

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- (1) The observer count gives the manager a general sense of the
 (2) run magnitude and a comparative information base on which to
 (3) judge escapements by week through the season and from
 (4) season to season
 (5) Q Now I ve placed in front of you Exhibit - Plaintiffs
 (6) Exhibit 302 What is the information contained in Plaintiffs
 (7) Exhibit 302?
 (8) A Well this just addresses the shortcomings of aerial
 (9) surveys and that is that they fall a little short in providing
 (10) an accurate actual count of all spawners within the stream
 (11) They fall a little bit short in providing consistent
 (12) observations throughout the spawning period and
 (13) observations
 (14) are periodic and do not usually cover the entire season
 (15) Usually budget considerations enter in and you can t send
 (16) these - these - can t often afford to continue the program
 (17) through the duration of the entire salmon run so we try to get
 (18) the main portion of it in our survey program throughout the
 (19) state
 (20) Consistent observations can be a problem because of
 (21) weather can blow you out the counting The counting
 (22) situations - the counting situations could not be desirable
 (23) may have problems getting a good accurate count in a certain
 (24) week It s not a given that you re going to be able to
 (25) consistently observe that thing from week to week
 (26) Accurate observation counts by species in some situations

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- (1) when you get pink and chums mixed in a stream and you have
 (2) one
 (3) species that s very dominant it s very difficult to estimate
 (4) the one that isn t quite as dominant
 (5) Q And on the bottom half of the same exhibit there s a
 (6) section entitled aerial survey error studies Would you
 (7) explain what that is to us?
 (8) A Yes Well anybody that s been experienced
 (9) in aerial surveys recognizes that it s a difficult thing to
 (10) accomplish on a regular basis There s a lot of things that
 (11) can cause problems There have been some studies in the
 (12) state
 (13) of Alaska undertaken by the Alaska Department of Fish &
 (14) Game
 (15) that have laid out that and examine this error factor And
 (16) one the first study that was undertaken was accomplished in
 (17) Southeast Alaska and in that study they showed that the
 (18) surveys had an overall error of around half And you know
 (19) essentially they re counting less than half of the fish that
 (20) are actually present in the stream
 (21) In Prince William Sound at the beginning of the oil spill
 (22) there was a special program research initiated to evaluate the
 (23) potential damage to natural resources and part of that program
 (24) was a study to examine the aerial survey program and
 (25) determine
 (26) what the error might be
 (27) So the Alaska Department of Fish & Game undertook this
 (28) study in 90 and 91 to evaluate in Prince William Sound the
 (29) potential error of the survey program In 90 which is an

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- (1) even year they found that there was a 41 percent overall error
 (2) in the index program In 91 an odd year like 1989 the year
 (3) of the oil spill there was a 75 percent overall error So
 (4) it s quite significant.
 (5) Q Sir what is Plaintiffs Exhibit 312?
 (6) A This is a comparison of the 91 Prince William Sound aerial
 (7) survey escapement estimates as derived by the index program
 (8) the program that the State uses to assess escapements to the
 (9) actual escapement as measured by a weir What they did in the
 (10) study was placed weirs in front of the mouths of ten of these
 (11) streams in Prince William Sound to get an actual count of the
 (12) number of fish that were swimming into the stream
 (13) THE COURT What s a weir?
 (14) THE WITNESS Weir is a fence device Your Honor -
 (15) BY MR O NEILL
 (16) Q Tell them
 (17) A Yeah That - it s like a picket fence placed in the
 (18) stream bed and prevents the fish from passing up into the
 (19) stream and what they have is a gate in the middle of this
 (20) fence with a platform above it It s usually a small gate
 (21) with - they put a light colored panel on the stream bed so
 (22) that they can sit on this - on this platform and visually
 (23) count the fish that swim over this light colored panel so you
 (24) get an accurate count of the fish that are moving through
 (25) Q So you have - you know exactly how many fish are moving

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- (1) through because you actually sit there and count them at the
 (2) weir and then you compare that to the aerial survey and you get
 (3) some wisdom out of that?
 (4) A Yes This histogram illustrates that the information that
 (5) results from that Fish & Game study you can see that there s
 (6) ten streams indicated here and for each one of these ten
 (7) streams we have three vertical bars
 (8) The first bar is the actual total escapement as measured by
 (9) the weirs The second bar - let me see here Come on -
 (10) well it doesn t want to do it
 (11) Anyway the second bar illustrates what was seen in the
 (12) aerial survey Now this is season total counts So you can
 (13) see that the survey program was substantially undercounting
 (14) the
 (14) actual number of fish that passed into that - into that river
 (15) into that stream
 (16) The third bar is just the difference between the two
 (17) That s the amount of error that occurred So you can see
 (18) through all these streams we ve got a significant amount of
 (19) error as indicated by I guess it s a gray bar on this
 (20) particular illustration
 (21) Q We re talking about Plaintiffs Exhibit 312 for the
 (22) record Now what if - and this one is a beauty Plaintiffs
 (23) Exhibit 310 We re getting into what is called a regression
 (24) analysis Before we talk about 310 why don t you tell us what
 (25) the heck a regression analysis is because the jury is going to

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- (1) hear more regression analyses in the next three days than they
 (2) ever ever cared to hear
 (3) A Probably A regression is simply a comparison of two sets
 (4) of data two variables to see if one variable has any
 (5) interaction or any influence on the second variable It s a
 (6) comparison of two sets of data and it s really a common sense
 (7) kind of thing where you re looking at - in this case we re
 (8) looking at aerial survey estimates versus the weir counts And
 (9) each one of these dots represents the results from a particular
 (10) stream Remember those ten streams that I had in the
 (11) illustration before? There s ten dots up here
 (12) So at this particular dot that the pointer s pointing at
 (13) you can see that the aerial survey estimate provided an
 (14) estimate of about 10 000 fish That s from - that s what the
 (15) index program through these aerial surveys ended up with for
 (16) that particular stream for that season And this is 1991
 (17) Now if you come up here and then read across, you see that
 (18) that 10 000 observed in the aerial survey actually represented
 (19) a weir count of 40 000
 (20) Now we fit a line through a statistical process called
 (21) regression and you could fit a line just by eyeballing it,
 (22) taking a straight edge and moving it around and try to minimize
 (23) the distances between the observation and where this line is
 (24) and try to minimize all the distances between all these points
 (25) in this line and that s the regression process It s a

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- (1) mathematical procedure
 (2) What it does it allows you to make interpretations from
 (3) this when you know that given a certain level of escapement as
 (4) observed by the - by the survey would indicate another level
 (5) in the total escapement and what we have here is a four fold
 (6) increase in the - what they see through the aerial survey
 (7) versus what was actually counted in the stream And this holds
 (8) throughout the range of the data
 (9) Q So we re able to take the aerial survey information and
 (10) apply a formula to it and come up with a number of fish?
 (11) A That s correct And essentially the formula is presented
 (12) up here where you have to take this formula and just plug in
 (13) the aerial survey Pointer s going wild
 (14) Q Where s the formula? Let s see if I can get that
 (15) A Well I didn t really want to look at that but let s
 (16) see -
 (17) Q You re supposed to I m kidding
 (18) A No I need the whole -
 (19) Q You need the whole thing?
 (20) A The whole thing down yeah I guess the point is that if
 (21) you had - you know anywhere along this line you re looking at
 (22) a four fold increase between the aerial survey and a weir count
 (23) and you can use this information to correct an aerial survey
 (24) adjust that and turn it into an actual total escapement
 (25) Q Now this data with regard to the study that was done after

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- (1) the spill that s called a - that study was done by Sam
 (2) Sharr?
 (3) A Yes
 (4) Q He is with Fish & Game or at the time was with Fish &
 (5) Game is that right?
 (6) A Yes he still is He s the research project leader for
 (7) Prince William Sound and this is -
 (8) Q So it would fit -
 (9) A This is the data that they produced and I used this in my
 (10) development of an estimate of what the harvest would have
 (11) been
 (11) had there not been a spill
 (12) Q And that s where we re going that s the subject we re
 (13) going to go to right now What would the harvest have been if
 (14) there wasn t a spill? Took us a while to get there but we re
 (15) there And if we could look at Exhibit - Plaintiffs Exhibit
 (16) 288 What is Plaintiffs Exhibit 288?
 (17) A Maybe you could just enlarge the 1 through 4 areas That
 (18) might be helpful could read it a little better
 (19) These are the steps involved in taking the information that
 (20) we ve gained from that research Fish & Game research and
 (21) what
 (21) we know about the 1989 run from the catch information and put
 (22) it together and come up with - the bottom line is what we want
 (23) to come up with is what the commercial fishery would have
 (24) harvested That s the common property harvest
 (25) So we start with the index escapement estimate and we have

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- (1) to multiply that times an error factor for the stream surveys
 (2) And stream surveys actually include two components the
 (3) observer error and the stream life factor that was also a
 (4) problem Okay That equals an index escapement corrected
 (5) We take that corrected index escapement figure and we have
 (6) to expand it because the index only covers 209 of those 1100
 (7) streams So we have to expand to make up for all the rest of
 (8) the streams to come up with an estimate of total escapement for
 (9) all of the streams in Prince William Sound
 (10) Okay We obtain that estimate then we add what actually
 (11) was removed in 1989 during the fishery in 1989 The fishery
 (12) removals include the commercial catch the common property
 (13) harvest that's what's taken by the fishermen The hatchery
 (14) cost recovery those are the fish sales that the hatchery has
 (15) to pay for their operations and the hatchery brood stock
 (16) which is the escapement that they need to put the eggs back
 (17) into the hatchery to make subsequent runs That gives us an
 (18) estimate of the total run for 1989 and it's corrected for this
 (19) survey problem
 (20) Okay We can turn that process around now We've got a
 (21) total run estimate for 1989 We subtract out what we believe
 (22) is the total escapement needed That's the total escapement
 (23) goal and we have to do some - some calculations to derive
 (24) that We have to then again remove what - what we think the
 (25) hatchery cost recovery should have been in a normal season
 and

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- (1) we remove what the hatcheries need for brood stocks and we
 end
 (2) up with an estimate what's left for the common property
 (3) fishery the catch that will go to the commercial fishermen
 (4) Q We're going to try this one more time And I'm going to -
 (5) escapement is the number of fish that gets up the streams?
 (6) A That's correct
 (7) Q And we went through the regression analysis so that we
 (8) could take the aerial counts that existed in 1989 and figure
 (9) out how many fish in fact went upstream?
 (10) A That's correct
 (11) Q And then we need to figure - we need to apply that data to
 (12) the streams that you didn't have aerial counts for?
 (13) A The unmonitored streams
 (14) Q And then now we know how many fish got upstream and in
 (15) order to figure out the total run size we add in what was
 (16) actually caught what the hatcheries recovered and the
 hatchery
 (17) brood stock?
 (18) A That's correct. That gives you a total picture of what
 (19) you know in terms of total fish that actually came back to
 (20) Prince William Sound in 1989
 (21) Q So now that we know what the total number of fish is we
 (22) can pull out what was actually caught what was actually
 (23) recovered by the hatcheries?
 (24) A Hatcheries
 (25) Q And what is left is -

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- (1) A What's left for the commercial fishery
 (2) Q Okay I put up on the screen Plaintiffs Exhibit 308 and
 (3) what is Plaintiffs Exhibit 308?
 (4) A This is a histogram It illustrates Prince William Sound
 (5) odd year pink salmon runs for the period 1973 to - to 1993
 (6) and it has a fitted - a trend line to trend line to the data
 (7) from 73 to 91 And this is done just to illustrate how my
 (8) estimate in the green column stacks up to what the recent past
 (9) has been recent past performance of the fishery in terms of
 (10) total run
 (11) And we see by this trend line that we projected - if you
 (12) use that trend line to project the harvest I mean a total run
 (13) for 1989 it would have equaled 36 million My estimate is
 (14) 31.4 million Okay
 (15) Just by another piece of information the Department of
 (16) Fish & Game forecasted a 44 million - or no 48 million total
 (17) run for 1989 That was the preseason forecast So that gives
 (18) you terms of reference I'm not trying to do any forecasting
 (19) with this trend line but merely offer it to put things in
 (20) perspective to see what has happened in the recent past
 (21) Q Okay I have two specific questions You said odd year
 (22) Why do you use odd year and even year with pink salmon?
 (23) A The pink salmon in Prince William Sound the runs are
 (24) actually broken into two components You have adult returns
 (25) that come back in even years and adult returns that come back

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- (1) in odd years Those two stocks don't really intermingle
 (2) because pink salmon have a two-year life cycle so there's no
 (3) exchange of - of reproduction between those two cycles As a
 (4) result those two cycles just show different patterns of
 (5) behavior within the spawning streams
 (6) The even year cycle pink salmon usually spawn to a greater
 (7) degree much greater degree in the intertidal areas the lower
 (8) reaches of the streams The odd year pink salmon utilize the
 (9) upstream areas more to a much greater degree so you've got
 (10) instream differences between these two There's also some
 (11) differences between the distribution within the districts So
 (12) if you want to compare 1989 to other years you're best to look
 (13) at odd years and not even years because it's the same group of
 (14) fish it's the general cycle (ck)
 (15) Q Now the next exhibit we're going to look at is Exhibit
 (16) 300 and it is a doozy (ck)?
 (17) A Yeah I apologize for this
 (18) Q You better
 (19) A Numbers
 (20) Q Let's see if we can -
 (21) A Let me try this
 (22) Q Okay
 (23) A Let's just look at the first part of this first
 (24) Q Go
 (25) A Okay This is the harvest estimates that I derived from my

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(1) study and if I call your attention to this common property
 (2) total down here it'll make the rest of these numbers kind of a
 (3) little easier to follow. But this is the total harvest that I
 (4) estimated going through the process that we described very
 (5) briefly for each species. So this is pink, the next one is
 (6) chum, followed by sockeye, coho and chinook. And down
 here I
 (7) have a common property total that I derived for pink salmon
 (8) in the case of pink salmon it's 19,286,000
 (9) I also - in my paper I also broke that into two
 (10) components. One was the Eshamy set gillnet harvest which
 (11) occurs in a very specific location in Prince William Sound
 (12) versus the seine and drift gillnet total. I didn't divide
 (13) those down at this particular stage so I have two components
 (14) of the catch to total the common property fishery total. These
 (15) are my estimates that I derived from my research.
 (16) Okay. Next I compared that to what was actually reported
 (17) from the commercial - from the fishery in Prince William Sound
 (18) in 1989 and illustrated here again is the common property
 (19) totals that were documented, recorded during the 1989 season
 by
 (20) Fish & Game
 (21) So the process was to come up with a harvest foregone, the
 (22) number of fish that would have been caught had there not been
 a
 (23) spill. You take - I took my estimate of common property
 (24) harvest, subtracted out what the department documented, and
 (25) then that provided the number of fish that were not harvested

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(1) that I believe could have been harvested during that season
 (2) And I have that illustrated by species on this last row of
 (3) figures on this illustration
 (4) Q Is it your opinion that the Exxon Valdez oil spill
 (5) prevented the commercial fishery fleet from catching these
 (6) fish?
 (7) A Absolutely. I believe very sincerely in this estimate. I
 (8) think that had we had a normal season, the management
 process
 (9) would have had the opportunity to test that run by the
 (10) commercial fishery and see that there was actually more fish
 (11) present than what the index escapement program indicated in
 (12) season (ck)
 (13) Q Okay. That last point, if there would have been a normal
 (14) commercial fishery in the southwest portion of the fishery, the
 (15) managers would have had more information with regard to the
 (16) size of the run?
 (17) A Well, yes. You kind of have to look at the mindset of the
 (18) manager also. He was staring a very significant forecast in
 (19) the face. Was a 48 million total run that was being forecasted
 (20) a record run. It was like a 41 million catch so they
 (21) probably in my judgment would have been very aggressive
 very
 (22) nervous about getting out there in front of that run and
 (23) testing it with the commercial fishery. They were precluded
 (24) from doing that because of the spill
 (25) The oil was in the way. Those districts had to be shut

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(1) down under the terms of the MOU developed by the State of
 (2) Alaska and as a consequence they didn't have that tool. They
 (3) had to rely totally on this index program for run assessment
 (4) for all those stocks within those - those streams and other
 (5) locations within Prince William Sound which was never
 designed
 (6) to accurately count every last salmon
 (7) There was a subsample process that's very valuable - I
 (8) don't want to discount - it's very valuable to the manager
 (9) It's an important tool for him, but you talk to most managers
 (10) they're going to say what I really want to look at is the
 (11) performance of the commercial fishery
 (12) Q And in the next set of exhibits we've quantified the
 (13) losses in dollars. Is that correct?
 (14) A Yes, that's correct.
 (15) Q Let's take a look at Plaintiffs Exhibit 292 and what is
 (16) Plaintiffs Exhibit 292?
 (17) A This illustrates what happens if you take the numbers that
 (18) I came up with, my estimates of lost harvest, foregone harvest
 (19) by gear type and applied an average weight that was recorded
 by
 (20) Fish & Game to come up with the total lost weight by gear
 (21) type again. Take that total lost weight times the average
 (22) price paid during 1989 as documented by Fish & Game, come
 up
 (23) with the lost harvest damage by gear type and then a total
 (24) This is for pink salmon. And I might add this is excluding
 (25) Copper River and Bereng River

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(1) Q What is Exhibit 296?
 (2) A This is the same information that's provided for chum
 (3) salmon for the lost chum salmon harvest and it's basically
 (4) the same exercise. We take lost harvest times average weight
 (5) come up with total pounds lost times an average price paid
 (6) and that provides the estimated lost harvest damage for chums
 (7) Q And Exhibit 287?
 (8) A It's the same illustration for sockeye for the lost
 (9) sockeye harvest documented that I estimated for in 1989, same
 (10) process
 (11) Q And Exhibit 298?
 (12) A This is the - the same information for coho harvest lost
 (13) in 1989
 (14) Q And did you summarize these in Exhibit 299 if I can get
 (15) it?
 (16) A Yes, it is. This is a summary of the 1989 Prince William
 (17) Sound foregone harvest value by species with the total
 (18) indicated
 (19) Q There we go. So Exhibit 299 is the summary of all the work
 (20) we've talked about up to this point?
 (21) A That's correct.
 (22) Q And it includes the estimates of the total run size, what
 (23) was actually caught, subtracted out to arrive at a lost fish
 (24) number and puts the dollar value on those fish?
 (25) A Based on what was actually paid during the 1980 season -

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- (1) 89 season
 (2) Q And this dollar figure of \$9 046 722 is the amount of money
 (3) that the fleet lost for the fish it didn't catch in 1989?
 (4) A That's my estimate yes
 (5) MR O NEILL I have no further questions
 (6) MR LYNCH Bring back some happy memories of your
 (7) deposition
 (8) CROSS EXAMINATION OF KENNETH P PARKER
 (9) BY MR LYNCH
 (10) Q Mr Parker my name is Pat Lynch and this is called
 (11) cross-examination I'm really interested in trying to clarify
 (12) some points on all of the subjects that you've talked about
 (13) both yesterday and today with a view to giving the jury all
 (14) the information that they would like to possess to evaluate
 (15) this estimate and other estimates
 (16) You'll agree won't you that this is - the numbers that
 (17) you've just presented is an attempt to estimate the number of
 (18) fish that were out there in 1989?
 (19) A That's correct.
 (20) Q And that depends in part for example on the accuracy or
 (21) the validity of data that you collected in 1990 and 91 or
 (22) that Sharr collected in 1990 or 91 and its applicability to
 (23) 89 You have to engage in some degree of judgmental
 (24) exercise is that correct?
 (25) A That's correct

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- (1) Q Now let's take first of all the subject you were
 (2) discussing yesterday afternoon the zero tolerance policy and
 (3) the memorandum of understanding How long were you with
 (4) the
 (5) Department of Fish & Game?
 (6) A For 18 years
 (7) Q Okay And during the time that you were with the
 (8) department was there ever a time in your experience when
 (9) there
 (10) was such an extensive set of closures of commercial fisheries?
 (11) A I don't recall anything of the magnitude that occurred in
 (12) 1989 occurring before
 (13) Q That was - that was the most extensive closure that you
 (14) ever saw was it not?
 (15) A Yes I believe so
 (16) Q And the goal behind that was to assure that the reputation
 (17) of the fishery the reputation of Alaska fisheries would be
 (18) protected for future years?
 (19) A The goal was to balance the need to ensure that tainted
 (20) product wouldn't reach the market and at the same time
 (21) provide
 (22) an opportunity for the commercial fisheries to harvest surplus
 (23) so it was a balancing technique
 (24) Q But the zero tolerance concept of it was that if it came to
 (25) a question of taking a risk of having one single tainted fish
 (26) reach the market the policy was to protect the market from a
 (27) single tainted fish isn't that correct?
 (28) A I don't know if I agree with that I think first off it

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- (1) wasn't a zero tolerance policy That was a term used in some
 (2) of the early drafts It was a memorandum of understanding that
 (3) involved the concept of appreciable likelihood So although it
 (4) was called commonly during the 89 season and 90 season a
 (5) zero tolerance there was not a zero tolerance There was no
 (6) guarantee that a single fish wouldn't enter the market
 (7) The State used its resources as best it could to ensure
 (8) that wouldn't happen but at the same time there wasn't a
 (9) guarantee
 (10) Q Well you're not saying are you Mr - or you're not
 (11) really saying that there was tolerance of fish with oil
 (12) reaching the market?
 (13) A No I'm not saying that
 (14) Q There was zero tolerance of that?
 (15) A No I'm trying to be realistic There's no guarantees in
 (16) life
 (17) Q Could you - there was zero tolerance of letting fish with
 (18) oil reach the market?
 (19) A Premeditated
 (20) Q And to the best of your knowledge no fish with oil in any
 (21) way associated with it ever did reach the market?
 (22) A That's correct
 (23) Q And beyond the aspects of the policy that involved
 (24) closures the memorandum of understanding involved
 (25) inspection
 (26) of the product when it reached the processor isn't that

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- (1) correct?
 (2) A That's correct
 (3) Q And destruction of the fish?
 (4) A That's correct
 (5) Q And replacement of any gear that was fouled?
 (6) A Yes
 (7) Q So it - the policy was not merely limited to closure when
 (8) there was an appreciable likelihood Beyond that if an
 (9) opening was allowed there were follow ups to have - to assure
 (10) that no fish reached the market is that correct?
 (11) A That was the plan that was indicated in the written
 (12) policy
 (13) Q And if there was oil in the water the manager was
 (14) instructed to close the fishery and not take the risk isn't
 (15) that correct?
 (16) A That's where the appreciable likelihood concept kicks in
 (17) Not if there is a drop of oil in the water
 (18) Q Not if there's a drop of oil in the water?
 (19) A That's correct
 (20) Q The fisheries were closed where tar balls or small amounts
 (21) of oil were observed and there was no way to be certain that
 (22) that wouldn't foul gear or fish isn't that true sir?
 (23) A When it was perceived likely that there would be a problem
 (24) the fishery was closed
 (25) Q Now in connection with those judgments those were made
 (26) by

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- (1) the area managing biologists is that the correct title?
 (2) A They were - they were off the emergency order actions
 (3) Let me explain emergency order It's a process that we use in
 (4) the Department of Fish & Game to open and close fisheries
 (5) They are initiated at the area level and it's our policy on
 (6) very controversial opening and closures for those orders to be
 (7) cleared through headquarters particularly my office and even
 (8) sometimes the office of the commissioner before they're
 (9) released So there's a review but the area biologist is the
 (10) one that initiates that action
 (11) Q In 1989 did you in your office ever call the decision of
 (12) the area managers to close a fishery in any case?
 (13) A I can't remember reversing any proposed action but what
 (14) usually transpired is we had conversations with the area
 (15) personnel and went over the action prior to its release and if
 (16) there was concerns you know we discussed those and
 (17) sometimes
 (18) they'd get changed
 (19) I had a deputy director that was assigned principally to
 (20) work on this issue and of course when he wasn't around I had
 (21) to do it myself
 (22) Q Now you testified yesterday that one of the major roles of
 (23) the Department of Fish & Game is to attempt to balance the
 (24) needs of the commercial fishery and recreational fishery and
 (25) replacement of the stock is that correct sir?
 (26) A That's correct

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- (1) Q And among those three concerns protecting the resource is
 (2) always number one isn't it?
 (3) A That's correct Conservation objective is probably
 (4) paramount among the other directives that the department has
 (5) to
 (6) operate under
 (7) Q And when we say protecting the resource we mean
 (8) protecting
 (9) the ability of the stock to reproduce and come back in future
 (10) years?
 (11) A That's correct
 (12) Q And that goal or that objective is something that guides
 (13) the operation of the Department of Fish & Game from year to
 (14) year to year correct?
 (15) A Yes
 (16) Q Whether there's an oil spill or whether it's a great year
 (17) is that correct?
 (18) A It is normally written into our management plans that
 (19) are - if we have allocated management plans they're written
 (20) into that. They're adopted by the board of fisheries (ck)
 (21) which is a public input process
 (22) Q And my question - I don't think you've quite answered my
 (23) question The point is that that goal concern to maintain the
 (24) stock is something that you're constantly monitoring It's
 (25) not something that you do only in emergency situations?
 (26) A That's correct
 (27) Q And that is the basis for the process that I think you've

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- (1) described in part this morning of having techniques to know on
 (2) an ongoing basis what escapements are?
 (3) A We have - the managers depending upon the fisheries that
 (4) they're managing the amount of financial resources that are
 (5) available to them they have certain tools in their bag and as
 (6) I mentioned before they apply those tools in balancing the
 (7) harvest to escapement
 (8) Q Again they apply those tools to balancing harvest to
 (9) escapement to protect the resource That was my question
 (10) A That's correct
 (11) Q And around the state - you reviewed with Mr O'Neill
 (12) yesterday all of the districts and explained to him the
 (13) subdistricts that you have around the state Around the state
 (14) you have different systems for determining what escapement is
 (15) occurring is that correct?
 (16) A That's correct.
 (17) Q Some of them are more precise than others?
 (18) A Depending upon the situation that the tool is used in and
 (19) the amount of resources that are available to that manager to
 (20) implement the programs yes
 (21) Q And I presume the physical characteristics of the place
 (22) where you're trying to monitor?
 (23) A Yes
 (24) Q Because I assume that - for example you described to
 (25) Judge Holland a weir this morning I assume - maybe I'm

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- (1) wrong - that you can't use a weir everywhere?
 (2) A No
 (3) Q And so you have to use different systems in different
 (4) places?
 (5) A Yes
 (6) Q Now in the areas that you've talked about yesterday where
 (7) this oil spill was involved what systems are used?
 (8) A It depends on the species For pink and chum the backbone
 (9) of the escapement assessment process is the aerial survey
 (10) backed up with foot surveys when that can be accomplished
 (11) And
 (12) then for other species such as sockeye we have weirs in place
 (13) on a couple of the major systems within Prince William Sound
 (14) Q What about in Cook Inlet and Chignik and Kodiak?
 (15) A Well in Cook Inlet we have sonar programs that allow us
 (16) to estimate escapements in major river systems We also have
 (17) some weirs in some of the smaller river systems to - to
 (18) monitor escapements In Chignik we have a weir on the
 (19) Chignik
 (20) River that has been in place since the days of federal
 (21) management
 (22) Q Do you have towers to count fish in any of those
 (23) locations?
 (24) A Towers in - I don't recall any tower operations in Upper
 (25) Cook Inlet or in Chignik The towers are pretty much used -
 (26) they're counting towers and they're - they're mechanical
 (27) structures that the biologist would climb up and sit on this

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- (1) elevated platform and look directly back down into the river
 (2) and count the salmon as they swim right along the riverbank
 (3) And there would be a light - a light colored panel placed on
 (4) the substrate of the river and this is a principal technique
 (5) in Bristol Bay for counting sockeye because you have
 absolutely
 (6) clear water and that's where it works best
 (7) Q To the best of your knowledge though those aren't used in
 (8) the areas that we're talking about?
 (9) A Not to my knowledge not in Upper Cook Inlet - you
 (10) mentioned Upper Cook Inlet and Chignik?
 (11) Q I think the five districts you talked about areas you
 (12) talked about Prince William Sound Upper and Lower Cook
 Inlet
 (13) Kodiak and Chignik?
 (14) A You didn't mention Kodiak at first Kodiak has some
 (15) counting tower situations if I recall right
 (16) Q Now of the various types that you've described is
 (17) there - are there different levels of precision in the
 (18) accuracy of the counts and the use that the ADF&G makes of
 (19) those counts?
 (20) A Yes
 (21) Q What is the most accurate in your experience?
 (22) A I think the weirs are probably the most accurate in
 (23) situations where the physical structure of the river and the
 (24) current is such that the weir is fairly secure that you don't
 (25) incur washouts which periodically happens in some systems

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- (1) where the river drainage receives an excessive amount of
 (2) rainfall and you have the weir wash out which is not uncommon
 (3) on occasion
 (4) But some weirs are - have those - some river systems
 (5) exhibit that kind of a problem and others don't It depends on
 (6) the drainage
 (7) Q What about counting towers? How do they - are they
 second
 (8) or third or -
 (9) A Well counting towers are subsampling escapements They
 (10) can't count around the clock can't keep the employees awake
 (11) that long so they subsample They count ten minutes out of
 (12) each hour So it's a subsample but in Bristol Bay where that
 (13) occurs with the very clear water it's a fairly accurate
 (14) program
 (15) Q What about sonar?
 (16) A Sonar is used to enumerate adult salmon escapements and
 (17) predominantly in Cook Inlet and it also provides an assessment
 (18) of escapement and is a very valuable tool as well
 (19) Q Does sonar work 24 hours a day?
 (20) A Yes it does
 (21) Q In ADF&G do you treat the sonar count as an index or do
 (22) you treat it as a - I think you used subsample or do you use
 (23) it as a pretty valid count?
 (24) A I think it's - in most situations my recollection is it's
 (25) used as a total count as they have a certain amount of water

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- (1) column that is insonified (ck) by that transducer The
 (2) transducer is the electronic unit placed in the water right
 (3) next to the riverbank's edge and the beam shoots out
 (4) horizontally into the water column And it can only go so far
 (5) because eventually it either hits the top of the water column
 (6) or it hits - it runs into the substrate on the bottom of the
 (7) river So the beam can only go out so far so they have to
 (8) interpolate for the rest of the river that isn't insonified
 (9) (ck)
 (10) Q And in your tenure as the director of the commercial
 (11) fisheries division was that the counting technique that you
 (12) relied on where you had sonar employed?
 (13) A Yes
 (14) Q Did you consider it accurate and reliable?
 (15) A We considered it reliable and accurate
 (16) Q Did you self criticisms that sonar tended to undercount as
 (17) you've said index streams did (ck)?
 (18) A Yes I received - when I was director I received
 (19) criticism on everything and one of which was the fact that
 (20) potentially that the sonar was not giving a correct count and
 (21) that's the way it was
 (22) Q And did you look into those? Did your staff look into
 (23) those?
 (24) A Yes We - we had staff that were principally assigned to
 (25) the sonar program to ensure that the equipment was working

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- (1) correctly and that the field crews were adequately trained and
 (2) that the technology was reviewed periodically We had annual
 (3) workshops to evaluate sonar counters see how they were (ck)
 (4) working
 (5) Q As director were you satisfied that they were a proper
 (6) basis for you to make your escapement account?
 (7) A I think they were a very valuable tool It's what we could
 (8) afford at that point in time I'm sure if you had unlimited
 (9) funds you could probably improve the technology but as it
 (10) was we felt we had a pretty good tool and we used it
 (11) Q Now we've covered towers weirs sonar and the last was
 (12) aerial surveys and stream walks?
 (13) A Yes
 (14) Q Have we covered all those techniques which were used in the
 (15) area you talked about yesterday?
 (16) A In some situations we used to judge the amount of salmon
 (17) escaping in the river In Bristol Bay we operate test fish
 (18) sights We use commercial gillnet gear right in the river and
 (19) test it in a certain location on each trying to get a sample
 (20) of the number of fish that are moving into the river In the
 (21) case of the Kvichak River in Bristol Bay that's been done for
 (22) a number of years and they can use the amount of catch that's
 (23) obtained in that test fishery to estimate the movement of fish
 (24) into the river So it is a way of gauging escapement that we
 (25) use in a number of systems around the state

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- (1) Q Did you use that in Prince William Sound Cook Inlet
 (2) Kodiak and Chignik?
 (3) A Well we're scratching some old tapes here but as I
 (4) recall we have used test fish procedures in Prince William
 (5) Sound I believe it was in '90 and '91 if I recall
 (6) correctly
 (7) Q Not prior to the spill that we're talking about here that
 (8) you recall?
 (9) A I'm not certain that it hadn't been used before but -
 (10) Q It wasn't a norm?
 (11) A It wasn't the norm
 (12) Q It wasn't what you used on a day in day-out basis to
 (13) determine how to protect the resource?
 (14) A Right
 (15) Q Now in each of these places where you used a different
 (16) method I take it that you in the Department of Fish & Game
 (17) tried to relate the method you were using to the objective of
 (18) protecting the resource? In other words you knew when you
 (19) were looking at aerial counts that they weren't as accurate as
 (20) weirs right?
 (21) A Uh huh
 (22) Q You knew that even before 1990 and '91?
 (23) A We knew that from other research that's been conducted on
 (24) examining the accuracy of aerial surveys there was a variable
 (25) depending upon a lot of factors including forest canopy

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- (1) available light color of the substrate a number of factors
 (2) that come into play on the accuracy of aerial surveys
 (3) Q Now the other aspect that you'd have to take into account
 (4) would you not is what the system that the fish were going to
 (5) could support is that true?
 (6) A Yes
 (7) Q In other words there's - it's not written on a stone
 (8) somewhere what the escapement can be up a given river or into
 (9) a given bay is that true?
 (10) A That's correct
 (11) Q And so you biologists would try to make an analysis of what
 (12) that given system whether it's a river system or a lake
 (13) system could support?
 (14) A That's correct.
 (15) Q Knowing what you know about the life practices of the fish
 (16) that you're concerned about, correct?
 (17) A That's correct
 (18) Q And in part you had this problem which I think you
 (19) mentioned to Mr. O'Neill that the fish don't - they aren't
 (20) nice enough to come along - all pinks come along and do their
 (21) thing and all the chums come along and do their thing they're
 (22) swimming together and so you have to balance the
 (23) requirements
 (24) for the various species that are swimming together?
 (25) A That's correct
 (26) Q So in each of these areas that we're talking about the -

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- (1) is it correct that the department had an escapement target or
 (2) objective or range that matched your view of the counting
 (3) technique against your view of what the system could support?
 (4) A We would develop estimates of optimum escapement given
 (5) the
 (6) extent of our data base and our ability to assess that and it
 (7) was quite variable from system to system throughout the state
 (8) species to species Probably one of the better programs for
 (9) doing that was in Bristol Bay and it varied throughout the
 (10) state
 (11) Q When you evaluate - do they call that the carrying
 (12) capacity of the system? Is that the right term?
 (13) A Well it depends on what you're - what species you're
 (14) talking about Some species don't require a lake to rear in
 (15) the stream and then they're immediately out into saltwater
 (16) Q What term would you use for that second situation?
 (17) A Well it's the optimum spawning capacity of the stream
 (18) Q Okay So carrying capacity spawning capacity depending
 (19) on which we're talking about right?
 (20) A Yeah
 (21) Q And I think you've already said this but just to be sure
 (22) there can be a great deal of variation in the carrying capacity
 (23) or the spawning capacity is that correct?
 (24) A Yes
 (25) Q And from your deposition I understand one thing that at

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- (1) least in lake systems will affect the capacity of the system to
 (2) support young fish is the number of fish that go up the stream
 (3) and die because when they die they supply nutrients into the
 (4) system that help create new food for their offspring is that
 (5) accurate?
 (6) A I think in my deposition we wrote a thesis on all the
 (7) factors that can contribute to the success of young salmon in a
 (8) river system
 (9) Q It was very helpful to me And in that thesis that was
 (10) one of the points you made?
 (11) A Yes
 (12) Q And in the bottom line of that thesis was that at least in
 (13) your experience the variation can - the carrying capacity of
 (14) a lake system might vary by as much as a factor of ten from
 (15) year to year?
 (16) A Yeah That was something I had pulled out of my head
 (17) during the deposition and it had been a while since I looked
 (18) at that research and I - you know that's what I said And
 (19) it's probably a reasonable estimate but you know it's been a
 (20) while since I've looked at that data
 (21) Q Well all agree that's an approximation We're all talking
 (22) about approximations here right?
 (23) A Yes
 (24) Q But there is a wide range of variation correct?
 (25) A Yes

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- (1) Q And so if you happen - in your fitting of the escapement goals to carrying capacity goals or spawning capacity goals (2) you have to try to match those two variables to hit somewhere (3) which is - makes common sense is that right? (4) A That s correct (5) Q And sometimes sometimes you re off? (6) A That s correct (7) Q You try to be conservative make sure you protect the (8) resource but you re also trying to maximize the utility of the (9) resource is that true? (10) A Yeah (11) Q And you had found over your career in some systems (12) including the Kenai River system that we ll be talking about (13) here that you would find that you had an escapement goal that (14) you thought was optimum and you learned that if you went above (15) that goal the system actually did better? (16) A That s correct. (17) Q And then you would raise the goal up? (18) A That s correct. (19) Q And over the 70s and into the 80s you were doing that (20) you did that a fair number of times in the Kenai River as to (21) sockeye salmon isn t that correct? (22) A That s true (23) Q And you really didn t know what - the point at which it (24) would be undesirable or damaging to the system to let more (25) fish

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- (1) go up You hadn t really found where the ceiling was is that (2) true? (3) A Well we - we thought we knew where the ceiling was and (4) by accident we d get an escapement that exceeded our (5) objective and you know not through any direct action by the (6) department but it was an accident and we d see that the (7) system could benefit from that level of escapement and if the (8) data supported that we would respond by elevating the (9) escapement objective for that system (10) Q So that over the five or six years prior to this oil spill (11) you d gone from a goal of about 300 000 sockeye escaping a (12) year up to somewhere in the 4- to 700 000 range is that correct? (13) A I think that s approximately correct (14) Q And in the year 1987 you d had a million and a half sockeye (15) escape which was more than double your goal is that correct? (16) A That s correct (17) Q And in 88 you had a million escape which was about (18) 300 000 more than your goal? (19) A That s correct in the Kenai River (20) Q In the Kenai River And talking about sockeye salmon (21) nght? (22) A Yes (23) Q Because you never have enough kings escape up - (24) A Not if you like king salmon fishing sport fishing (25) Q I mean from the standpoint of your constituents

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- (1) A True (2) Q Now when you reached this conclusion that it was in the (3) best interest of the Alaska fishery to have what people called (4) a zero tolerance policy you recognize that one effect of that (5) might be that fish would go uncaught and would overuse (6) systems (7) isn t that correct? (8) A That s correct (9) Q And so your managing biologists your area managers one (10) of (11) the things - the responsibilities they had under the zero (12) tolerance policy was to try to keep an eye keep a (ck) weather (13) eye on not having all the fish swim up the streams or up the (14) rivers or into the lakes is that correct? (15) A Well I m not sure that I understand the - your question (16) Our biologists were obligated to abide by the memorandum of (17) understanding and if we saw that - that closure of the (18) fishery was required under the terms of that MOU we d have to (19) close the fishery down and suffer the consequences (20) Q Well let me show you PX280 here which is labeled draft (21) and it s a policy on overescapement as it pertains to (22) management of fisheries impacted by presence of - of oil in (23) harvest area fisheries This document was generated was it (24) not as in response to the memorandum of understanding? (25) A No Let me see the heading on that document please (26) Q Sure (27) A Okay That document was a straw dog that was developed (28) by

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- (1) my staff at my request to initiate discussion within our (2) biologists on what options might be available to us to utilize (3) surplus fish that may be - may occur as a result of the oil (4) spill And this - this was a draft that was never approved by (5) the department it was not approved by my office and it was a (6) source of a lot of discussion in our - in the division of (7) commercial fisheries which I head - headed at that point (8) And you know as you ll probably show there was further (9) discussion that it became very obvious that this was (10) unrealistic and not something that would benefit the public or (11) the resource (12) Q Well I think my question to you was was this document (13) generated as a result of the memorandum of understanding? (14) Are (15) you saying this document was not generated as a result of the (16) understanding that you would be doing closures under the (17) memorandum of understanding? (18) A I m not sure what the sequence was Immediately when we (19) saw the oil spill we were concerned that there might be a (20) situation and I think we were looking at Kodiak actually at (21) that point in time that we d have a very large surplus of (22) salmon going up the stream and we were concerned about (23) potential of overescapement so we started this discussion (24) within my staff And I m not - I don t agree or I can t agree (25) that this was a result of zero tolerance - of the MOU I (26) think -

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- (1) Q Okay
- (2) A - this may have actually occurred before the MOU was signed
- (3) signed
- (4) Q Fine This was a result of your expectation that there would be closures however that happened correct?
- (5) would be closures however that happened correct?
- (6) A That s correct
- (7) Q And it was a result of your recognition that if there were closures there d be a lot of fish going uncaught that might have a natural instinct smelling their Native stream there in the water might have a natural instinct to swim up the stream and eat more of their share of the resource up there right?
- (8) closures there d be a lot of fish going uncaught that might have a natural instinct smelling their Native stream there in the water might have a natural instinct to swim up the stream and eat more of their share of the resource up there right?
- (9) and eat more of their share of the resource up there right?
- (10) the water might have a natural instinct to swim up the stream and eat more of their share of the resource up there right?
- (11) and eat more of their share of the resource up there right?
- (12) A That s correct
- (13) Q Or actually eat their share which would be more than -
- (14) A Was available
- (15) Q Put everybody on a starvation diet right?
- (16) A Right
- (17) Q As a biologist charged with protecting the resource first and foremost you focused on the fact that you should be prepared to do something about it is that correct?
- (18) and foremost you focused on the fact that you should be prepared to do something about it is that correct?
- (19) prepared to do something about it is that correct?
- (20) A Well I think it wasn t that we had to implement something right away it was more that this is something that we should have some dialogue on and see if there are any possible solutions And as it turned out there wasn t
- (21) right away it was more that this is something that we should have some dialogue on and see if there are any possible solutions And as it turned out there wasn t
- (22) have some dialogue on and see if there are any possible solutions And as it turned out there wasn t
- (23) solutions And as it turned out there wasn t
- (24) Q So you should have some dialogue on the question of whether
- (25) there - at least in some cases the State should take

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- (1) emergency steps is that right?
- (2) A Yes
- (3) Q To catch fish even if they weren t going to be harvested commercially?
- (4) commercially?
- (5) A That s correct
- (6) Q In order to thin out the number of fish escaping up into rivers streams bays wherever the spawning was going to occur?
- (7) rivers streams bays wherever the spawning was going to occur?
- (8) occur?
- (9) A That s correct
- (10) Q And you tell us now that you ultimately concluded that it wasn t realistic to do that?
- (11) wasn t realistic to do that?
- (12) A That s correct
- (13) Q Why is that?
- (14) A There are both socioeconomic concerns that became real apparent to us in terms of the State going in there and harvesting these fish there was also biological concerns with us directing a fishery either right in the mouth of the river system or up in the river system
- (15) apparent to us in terms of the State going in there and harvesting these fish there was also biological concerns with us directing a fishery either right in the mouth of the river system or up in the river system
- (16) harvesting these fish there was also biological concerns with us directing a fishery either right in the mouth of the river system or up in the river system
- (17) us directing a fishery either right in the mouth of the river system or up in the river system
- (18) system or up in the river system
- (19) And as an example - well you can just envision what it would be like to send a drift gillnet fleet up into the Kenai River to harvest the surplus sockeye
- (20) would be like to send a drift gillnet fleet up into the Kenai River to harvest the surplus sockeye
- (21) River to harvest the surplus sockeye
- (22) So these things kind of immediately came - became very apparent to us and it just was unreasonable It would violate the terms of management plans allocated management plans developed by the board of fisheries the Alaska Board of
- (23) apparent to us and it just was unreasonable It would violate the terms of management plans allocated management plans developed by the board of fisheries the Alaska Board of
- (24) the terms of management plans allocated management plans developed by the board of fisheries the Alaska Board of
- (25) developed by the board of fisheries the Alaska Board of

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- (1) Fisheries that is charged with allocating resources between competing users
- (2) competing users
- (3) Q Are you saying Mr Parker that you got to the - you came to the conclusion that if you as biologists felt that allowing escapement to occur would jeopardize the viability of the resource you had no way to pull those fish out of the stream?
- (4) to the conclusion that if you as biologists felt that allowing escapement to occur would jeopardize the viability of the resource you had no way to pull those fish out of the stream?
- (5) escapement to occur would jeopardize the viability of the resource you had no way to pull those fish out of the stream?
- (6) resource you had no way to pull those fish out of the stream?
- (7) A What I m saying is that we - we had to deal with a realistic biological realism of - I m not putting these words together right
- (8) realistic biological realism of - I m not putting these words together right
- (9) together right
- (10) We had to deal with the consequences of going in with a directed harvest that had - in a very confined space within a river that would have very significant biological consequences on other species such as freshwater fishes that reside in that area of the river It would also violate certain management plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (11) directed harvest that had - in a very confined space within a river that would have very significant biological consequences on other species such as freshwater fishes that reside in that area of the river It would also violate certain management plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (12) river that would have very significant biological consequences on other species such as freshwater fishes that reside in that area of the river It would also violate certain management plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (13) on other species such as freshwater fishes that reside in that area of the river It would also violate certain management plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (14) area of the river It would also violate certain management plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (15) plans that were developed allocated management plans that were developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (16) developed by the board of fisheries and it just wasn t the providence of the Department of Fish & Game the State of Alaska to get involved in this
- (17) providence of the Department of Fish & Game the State of Alaska to get involved in this
- (18) Alaska to get involved in this
- (19) Q You also felt did you not that you weren t certain that it wasn t to the benefit of the fishery in any case that you knew about to have the escapement occur?
- (20) it wasn t to the benefit of the fishery in any case that you knew about to have the escapement occur?
- (21) knew about to have the escapement occur?
- (22) A That s correct
- (23) Q And you thought that this provided a low cost or no cost chance to find out more about the carrying capacity of places where - or escapement might be about to happen?
- (24) chance to find out more about the carrying capacity of places where - or escapement might be about to happen?
- (25) where - or escapement might be about to happen?

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- (1) A I don t think I follow that question Maybe try it again
- (2) Q Wasn t it a part of your thinking when you were kicking these things around that since the - normally you would not want to have escapement because you want to be sure that fishermen can catch the commercially harvestable fish right?
- (3) these things around that since the - normally you would not want to have escapement because you want to be sure that fishermen can catch the commercially harvestable fish right?
- (4) want to have escapement because you want to be sure that fishermen can catch the commercially harvestable fish right?
- (5) fishermen can catch the commercially harvestable fish right?
- (6) A Uh huh
- (7) Q And as you put it in your deposition you re concerned about saving Alaska jobs and income correct?
- (8) about saving Alaska jobs and income correct?
- (9) A That s obviously something the State has to be concerned about
- (10) about
- (11) Q Absolutely I didn t mean any suggestion of criticism but that s a cost you d have to pay if you let too many fish go up the river correct?
- (12) that s a cost you d have to pay if you let too many fish go up the river correct?
- (13) the river correct?
- (14) A True
- (15) Q In this case the fish weren t going to be caught anyway?
- (16) A That s correct
- (17) Q And so you felt that it was a low cost or no cost opportunity to determine if the - if the rivers streams spawning places had more - more capacity you thought there was valuable information to be learned from that experience?
- (18) opportunity to determine if the - if the rivers streams spawning places had more - more capacity you thought there was valuable information to be learned from that experience?
- (19) spawning places had more - more capacity you thought there was valuable information to be learned from that experience?
- (20) was valuable information to be learned from that experience?
- (21) A You re saying that we felt it would be valuable to go ahead and let the overescapement occur so that we could evaluate the results of a larger escapement? Is that your question?
- (22) and let the overescapement occur so that we could evaluate the results of a larger escapement? Is that your question?
- (23) results of a larger escapement? Is that your question?
- (24) Q I m asking if that wasn t the view of some of the people in your department when you were deciding what the proper action
- (25) your department when you were deciding what the proper action

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- (1) what the best course to take was in terms of protecting the resource?
 (2) A Oh yeah I had lots of different views in my staff about
 (3) this issue and that was certainly one of them
 (4) Q Now with reference to your - the estimates you gave this
 (5) morning about Prince William Sound - first of all what -
 (6) what as you recall it was the split as of 1989 between
 (7) hatchery reared adults or hatchery started adults hatchery
 (8) born returning fish and wild stock?
 (9) A Well the hatchery stocks were dominating the return of
 (10) adult pink salmon in Prince William Sound in 89 and in the
 (11) prior years immediately preceding 89 There s no question
 (12) about the dominance of hatchery production in those returns
 (13) Q Would you agree that they represented about 75 percent of
 (14) the returning fish?
 (15) A It was that high
 (16) Q And each year what were the hatcheries releasing into the
 (17) Sound in terms of numbers of fry or juvenile fish?
 (18) A I don't really recall off the top of my head
 (19) Q 200- 300 000 correct?
 (20) A It was a major -
 (21) Q Sorry 2 to 300 million?
 (22) A Yeah that s more like it
 (23) Q Well these numbers are too big for me
 (24) Were you here when we had the videos yesterday of the purse
 (25)

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- (1) seining and how pink salmon are caught?
 (2) A Yes
 (3) Q Of course those probably looked very familiar to you
 (4) because you ve seen a lot of that but I couldn't tell when I
 (5) looked at those fish coming up which ones were the hatchery
 (6) fish and which ones were the wild ones Could you?
 (7) A They re the ones with the H on the side
 (8) Q Can we rerun the tape so you can point that out to me?
 (9) A No you can t You can t tell by looking at the fish
 (10) whether it s hatchery run or wild stock
 (11) Q Now earlier today you were talking with Mr O Neill about
 (12) these migration corridors out there I guess southwest end of
 (13) the Sound Let me see if I can find that 203?
 (14) MR SANDERS 303
 (15) MR LYNCH PX303 let s see if that s it I think
 (16) it s 203
 (17) MR O NEILL It s 303 Pat You want to bring it
 (18) up?
 (19) MR LYNCH Which is it going to be?
 (20) BY MR LYNCH
 (21) Q Now you - you know the light pen Mr Parker But you
 (22) were referring to the spaces in between Montague Island and
 (23) the other islands that - LaTouche Island and the other islands
 (24) here Could you just point to that?
 (25) A This area right here passes - major passes into Prince

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- (1) William Sound are right through here
 (2) Q Okay Now you said that in an average year or a normal
 (3) year 50 percent of the pink salmon catch occurs down there is
 (4) that correct?
 (5) A I think that s a long term average In more recent years
 (6) since the spill it s - every one s been higher than that
 (7) Q What was it in 1988?
 (8) A 1988 it was - I was just looking at that I believe it
 (9) was like 50 percent 51 percent
 (10) Q Isn t it the case that in 1988 most of the fishery was a
 (11) terminal fishery?
 (12) A Well I m not sure how you could say it was terminal
 (13) fishery if you had 51 percent of the harvest that occurred in
 (14) the southwestern district
 (15) Q It s your testimony that 51 percent of the harvest that
 (16) occurred -
 (17) A There was - there was a commercial opening in the
 (18) southwestern district I think it was primarily aimed at
 (19) harvesting chum salmon during that year but there was -
 (20) Q Go ahead
 (21) A - harvest from that district dominating the catch That s
 (22) why I reviewed the 1988 annual management report just
 (23) yesterday and that s the number that comes back to my mind
 (24) Q And were those - was that catch in front of the AFK
 (25) hatchery?

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- (1) A It depends on what you call in front of
 (2) Q In the special terminal fishery area that was established
 (3) A I didn t have an opportunity to look at the emergency order
 (4) that was issued for that opening It listed the number the
 (5) emergency order number but I didn t have an opportunity to
 (6) look at that I was curious about the same issue but there
 (7) was - I m not sure of the boundaries of that opening
 (8) Q All right Let s go back at this and get back to 1988
 (9) in the 70s there was little or no harvest hatchery
 (10) production of pink salmon in Prince William Sound Is that
 (11) correct?
 (12) A That s correct
 (13) Q And it built up over the 80s to the point where
 (14) in 88/ 89 hatchery fish were about 75 percent of the total
 (15) number of fish coming back to be harvested?
 (16) A In 88 I don t agree with the 89 figures obviously
 (17) because I ve come up with my own estimates of wild stock
 (18) Q But do you believe that your estimate of wild stock would
 (19) have been equally applicable to 88?
 (20) A Oh I do The situation was - well no I - let me back
 (21) up You had survey error differences between even and odd
 (22) years so you can t reasonably apply the magnitude of the
 (23) survey error that was observed in 91 an odd year to an even
 (24) year
 (25) Q Let s talk about that for a second When you say there was

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- (1) survey error differences from even to odd years you re
 (2) referring to the two studies that Mr Sharr did at his weir?
 (3) A Mr Sharr investigated this and we have to be careful that
 (4) we re not - and I try - I think I brought this up when I
 (5) discussed it earlier It s not just observer error It s the
 (6) index program which includes two components the observer
 error
 (7) and the stream life factor which was - it s a measurement
 (8) that s used in the calculation of total spawners within that
 (9) stream So there s two components there
 (10) Q Just for sake of calibration do you know off the top of
 (11) your head how big the observer error is and how big the stream
 (12) life adjustment is in your calculation?
 (13) A In the 90 results the observer error was not even near
 (14) the level that it was in 91 The major error in 90 was
 (15) attributed to stream life
 (16) Q I think my question was in the adjustment that you made
 (17) how much of the adjustment you made - you used 1991 figures
 (18) correct?
 (19) A Uh huh
 (20) Q How much of that was attributable to observer error and how
 (21) much was attributable to stream life differences?
 (22) A In my estimations I did not separate that because I did not
 (23) have access to the data at the time and so what I ended up
 (24) doing is addressing that issue by looking at the final results
 (25) comparing the escapement index through the traditional
 program

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- (1) to what was actually monitored in the weir And that would
 (2) bring together the two components to that index program error
 (3) Q Okay Now this is Exhibit 288 PX288
 (4) A Yes
 (5) Q This is the document you showed us that explained how
 (6) you - how you went about making these adjustments?
 (7) A That s correct.
 (8) Q And I see you saying that you ve got aerial survey error
 (9) plus in boldface stream life factor Is that - that didn t
 (10) happen?
 (11) A What that is meant to mean is both of those factors
 (12) There s one factor that includes survey error and stream life
 (13) so it s - and I didn t indicate that it was two separate
 (14) adjustments I have multiplied my aerial survey error and
 (15) stream life factor not factors
 (16) Q I guess what I m asking you is are you able to split those
 (17) two out or did you have to -
 (18) A I didn t. I didn t split those two out.
 (19) Q So you don t know how much of your - you adjusted by a
 (20) factor of four is that correct?
 (21) A Yes
 (22) Q And what that means is that in your opinion for every fish
 (23) that the people in the airplanes saw and counted there were
 (24) actually four fish in the water?
 (25) A That s what the Department of Fish & Game data indicated

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- (1) when you look at the - comparing the final season count as
 (2) developed by the index program to what actually went into that
 (3) stream as measured through the weir
 (4) Q Well let s - let s try to be precise It s what Mr
 (5) Sharr working for the Department of Fish & Game found when
 he
 (6) looked at the weir in 1991 correct?
 (7) A Mr Sharr yes
 (8) Q Mr Sharr That wasn t done in 1989?
 (9) A It was not done in 89
 (10) Q And there is no ADF&G document which has these numbers
 that
 (11) you re talking about for 1989 correct?
 (12) A I m sorry?
 (13) Q There isn t any ADF&G document which purports to say this
 (14) is an actual count based on 1989 data?
 (15) A The department has gone back and reestimated the
 (16) escapement the total escapement for all prior years
 (17) Q But that s not what you used in this calculation?
 (18) A No I did not
 (19) Q All right I m talking about what you used in this
 (20) calculation and you multiplied the - the numbers that the
 (21) department had by four right?
 (22) A That s correct.
 (23) Q And that - that four time factor is a combination of the
 (24) aerial survey error plus the stream life factor because you
 (25) couldn t split them out?

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- (1) A I didn t have access to the data -
 (2) Q Right
 (3) A - to split it out at that point in time
 (4) Q That s the best you could do right?
 (5) A That s correct.
 (6) Q And what you found was that according to what Schure or
 (7) Sharr measured in - sounds like a fish Now I can stay with
 (8) it.
 (9) What he measured in 1991 was that the aerial surveyor in
 (10) 1991 every time he saw a fish Sharr counted four fish in his
 (11) weir?
 (12) A The survey program?
 (13) Q Right
 (14) A It wasn t one individual surveyor
 (15) Q Well he was comparing aerial survey though to -
 (16) A What was actually counted in the stream
 (17) Q What he was counting at his weir right?
 (18) A Yes
 (19) Q Okay Now the other work that you mentioned in one of
 (20) your exhibits here PX302 we talk about the work of Dangel and
 (21) Jones in 1988 They work for ADF&G, too correct?
 (22) A Yes
 (23) Q And they found that observer error in southeast - that s
 (24) down by Juneau?
 (25) A Yes

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- (1) Q That the observer error showed consistent average errors
 (2) ranging between 77 percent and 38 percent?
 (3) A That s correct Well that was individual observer error
 (4) Q Individual observer meaning that s one -
 (5) A For that observer
 (6) Q One surveyor could be better than the other?
 (7) A That s correct
 (8) Q And in fact in putting together your estimate you used
 (9) numbers starting in 1987 correct the escapement index
 (10) starting in 1987?
 (11) A Yes
 (12) Q And running through 1991 is that true? Is that correct?
 (13) You have to answer -
 (14) A It depends on what portion of the analysis I guess that
 (15) you re referring to
 (16) Q In looking at the - in looking at the reported aerial
 (17) survey data for Prince William Sound the index stream data
 (18) you used the data set from 1987 to 1991?
 (19) A I used those base years in some of the calculations yes
 (20) Q And the reason you chose 1987 to 1991 was because you
 (21) believed that during that period they had a single predominant
 (22) maybe not exclusive but the principal surveyor was James
 (23) Brady?
 (24) A We had a team of surveyors that conducted surveys and in
 (25) early years it was left to one individual and then in 89 it

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- (1) A That s correct
 (2) Q And it s true though if you did what the department did
 (3) and adjusted all the way back that would reduce your estimate
 (4) if you used a consistent factor going back to 82 for example?
 (5) A I think it would reduce it in the run less escapement goal
 (6) approach (ck)
 (7) Q Which is what -
 (8) A And I d have to think about that or - no it wouldn t
 (9) reduce it in the run less (ck) escapement run goal approach
 (10) but it might have had a minor impact on the mean harvest rate
 (11) approach and you obviously know what I m talking about but
 (12) unfortunately the jury doesn t (ck)
 (13) Q You recall testifying at your deposition by excluding the
 (14) 82 to 85 period you increased the estimated lost harvest?
 (15) A I don t recall that specific statement but if you say it I
 (16) don t disbelieve you
 (17) Q You want to look at page 700?
 (18) A I -
 (19) Q I ll represent to you it s there and we can all save some
 (20) time
 (21) A I m sure it probably is
 (22) Q Now in 1990 Mr Brady who had been there since 1987 was
 (23) reassigned and went elsewhere is that correct?
 (24) A He was still involved in that fishery He was elevated in
 (25) his position

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- (1) was developed into a team approach mainly because of the
 (2) spill and the responsibilities for that program were shared
 (3) Q Okay But your reason for choosing 1987 to 91 was that
 (4) you believed that that represented the observations of a single
 (5) consistent observer isn t that true?
 (6) A I felt basically that the farther you get away from 1991
 (7) when the research was actually conducted perhaps the weaker
 (8) the relationship exists and I - I don t really have a - you
 (9) know a quantitative basis for that I know that the
 (10) department has gone back and used the 1991 data to correct
 (11) past
 (12) odd years They didn t stop at 87 They went all the way
 (13) back to the data base and they - in the same way they took
 (14) the 1990 -
 (15) Q Did they use -
 (16) A - study results -
 (17) Q And did they use multiplier four?
 (18) A - and went back through the even years in the historical
 (19) data base so they ve taken the studied years and applied them
 (20) back I felt uncomfortable because I didn t have access to
 (21) the raw information the data that Sharr had collected the sew
 (22) /SAO (ck) what variation might have been due to - or between
 (23) observers
 (24) Q So that all boils down to you felt you had a more
 (25) consistent set of observers when you used 1987 to 91 is that
 correct?

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- (1) Q He wasn't the person -
 (2) A He went to the regional
 (3) Q He wasn't continuing to fly in the airplane as he had been
 (4) from 87 to 90 and count the fish?
 (5) A That s correct
 (6) Q The closest connection you can get on that is you think he
 (7) had something to do with training his successor?
 (8) A Well it actually goes further than that. There was three
 (9) observers in 1989 and two of those three were still there in
 (10) 90
 (11) Q Right
 (12) A Okay and there was a new one added
 (13) Q Right And in 1991?
 (14) A There was - there was a cadre of four individuals
 (15) surveying in 90 and three of those individuals were there in
 (16) 91 One was replaced with another individual
 (17) Q And that was Brady the one who was replaced?
 (18) A Brady
 (19) Q And Brady had had the primary responsibility in '89 isn t
 (20) that correct?
 (21) A He had the primary responsibility but in reality he was
 (22) so overwhelmed by oil related activities including meetings in
 (23) Valdez that others had to take the dominant role on surveys in
 (24) 89
 (25) Q We ll ask him about that In any case the people who were

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- (1) watching the fish in 1990 were not the people who were watching
- (2) the fish in 1989?
- (3) A They were to some degree
- (4) Q To the degree that one of the three was still there?
- (5) A Okay rephrase - let me have that again
- (6) Q People who were watching the fish from the airplanes in
- (7) 1991 were not the same people who watched the fish in 1989?
- (8) A At least two of them were
- (9) Q At least two of them were different?
- (10) A Were the same
- (11) Q In 1991?
- (12) A In 91 yes
- (13) Q There were three people in 89 I think we established that?
- (14) A Yes
- (15) Q And one of them left in 90 and the other one left in 91 doesn't that leave one?
- (16) A I can't recall off the top of my head exactly I'd have to get out my records but I did go through this issue and there was continuity that was maintained between 89 90 and 91
- (17) Q Okay now in - in your assumption because of what Sharr learned in 91 you concluded that the biologists in 89 were only seeing 25 percent of the fish that were swimming up the streams is that correct?
- (18) A That's correct

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- (1) Q Now it's true is it not that in the years leading up to
- (2) 1989 the biologists your colleagues were concerned in Prince
- (3) William Sound that the wild stock the resource was declining?
- (4) A That's correct
- (5) Q And it's true that as a result of that they had developed
- (6) a concept of - of conducting terminal fisheries in Prince
- (7) William Sound to protect the wild stock isn't that so?
- (8) A That's correct.
- (9) Q Now could you explain what a terminal fishery is and why
- (10) that would protect the wild stock?
- (11) A Well in an ideal situation what you want to do is have
- (12) your commercial fishery right in front of the mouth of the
- (13) stream so that your harvest is impacting specifically that
- (14) stream and not other streams but the reality of the situation
- (15) is that the product quality is very poor in these terminal
- (16) areas and if you jam that fleet right up against the mouth of
- (17) the stream you're going to end up with colored fish, dark fish
- (18) and off product quality and just isn't desirable
- (19) So from the - from the market standpoint from the fish
- (20) condition standpoint it's more optimal to harvest those fish
- (21) as they enter Prince William Sound Does that answer -
- (22) Q I don't believe it does but I'll take another shot at it.
- (23) A Let's try again
- (24) Q What is a terminal fishery and how does it protect the wild
- (25) stock?

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- (1) A Okay a terminal fishery can be just about anything It
- (2) can - a terminal fishery can be classified you know
- (3) depending upon what you mean by terminal as a fishery in
- (4) Prince William Sound as opposed to a fishery off the entrance
- (5) of Prince William Sound See it's a matter of degree
- (6) We call our fisheries in - in the northern district
- (7) terminal fisheries because they're on the inside portion of
- (8) Prince William Sound the northern portion but there's fish
- (9) from other districts that are swimming through there It's not
- (10) exactly a terminal fishery It's a term that's very difficult
- (11) to interpret unless you know specifically what you're - I
- (12) don't know if I'm clear on this but -
- (13) Q Let me ask let me try to lead you a little Isn't it a
- (14) fact that as a part of the management of fishing in Prince
- (15) William Sound that ADF&G assigned certain areas in the
- (16) vicinity of hatcheries where commercial openings were
- (17) allowed?
- (18) A Yes
- (19) Q And isn't it a fact that in 1988 for example ADF&G closed
- (20) other areas in the migration corridors so that the commercial
- (21) fishery would not intercept the wild stock that was trying to
- (22) make its way through those corridors and back up to the
- (23) entrances to streams in other parts of the Prince William
- (24) Sound?
- (25) A During the 88 season they did
- (26) Q Okay

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- (1) A But that was done later on in the season initially they
- (2) did have just full district openings in some cases to harvest a
- (3) very abundant chum run that was developing in 1988
- (4) Q But just - all we're talking now is the definition of
- (5) terminal fishery Wasn't it common to refer to the specially
- (6) assigned areas in the vicinity of the hatcheries as a terminal
- (7) fishery?
- (8) A There is a zone that has been identified in front of these
- (9) hatcheries that's called the terminal - special - the
- (10) hatchery terminal harvest area and that is a specific area
- (11) and that is essentially envisioned and meant to be a terminal
- (12) fishery Now the whole district out in front of that isn't
- (13) necessarily a terminal fishery and that's the kind of word
- (14) problem that we're in here
- (15) Q Let's just try to clear it up There is a zone called the
- (16) special terminal fishery area?
- (17) A Yes something like that.
- (18) Q Zone and the concept is that by the time you get that
- (19) close to the hatchery statistically it's more likely than not
- (20) that even though they don't have the He emblazoned on their
- (21) side, that these fish are fish that are trying to make their
- (22) way back to the hatchery is that correct?
- (23) A That's correct.
- (24) Q And there may be a few wild stock in there but on balance
- (25) you're hoping that the wild stock took the off ramp somewhere

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- (1) along the way before they got there and headed elsewhere in the
- (2) Sound to their home base is that correct?
- (3) A That s correct
- (4) Q And the idea is that on the one hand the commercial
- (5) fishermen can get the majority of the hatchery stock which is
- (6) not threatened correct?
- (7) A That s correct.
- (8) Q And at the same time the biologists are protecting the
- (9) resource by letting the wild stock escape?
- (10) A That s correct
- (11) Q Now based on these aerial surveys which according to your
- (12) hypothesis we re only counting one quarter of the fish and
- (13) have been doing that for 20 years right? Had been using
- (14) aerial surveys?
- (15) A Oh they have been using aerial surveys this process that
- (16) I explained since the early 60s That s when it was
- (17) initially developed
- (18) Q And at least according to your - the data that you
- (19) developed for this program you assumed that they were
- (20) basically consistent from 87 to 91 right?
- (21) A Yes that s true
- (22) Q And during that period of time they were seeing the wild
- (23) stocks decline even though they were letting three times as
- (24) many fish or four times as many fish get up the streams as they
- (25) thought were letting get up the streams?

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- (1) A Well you classified the wild stock as declining if you
- (2) look at the odd year returns as presented in Donaldson - in
- (3) the 1991 or 90 annual management report the stocks had
- (4) bounced around There s no clear pattern that they ve been
- (5) reducing And if you eliminate 89 which I contest so I m
- (6) not of the mind that I totally agree that we ve got a dramatic
- (7) decline if that s the picture that - that you re trying to
- (8) present -
- (9) Q Let me ask you this question When you - before you
- (10) retired before you had scientific studies done in 1990 back
- (11) in 1988 and 1989 when you were trying to manage the State
- (12) wide
- (13) commercial fishery for the benefit of everybody one of the
- (14) problems that your department had was the belief that the wild
- (15) stock was being jeopardized by the hatchery catch is that
- (16) correct?
- (17) A That s correct
- (18) Q And Mr Brady who really had the monkey on his back to try
- (19) to protect that resource was concerned that there weren t
- (20) enough wild fish getting back to keep that resource coming
- (21) back
- (22) year after year?
- (23) A That s correct
- (24) Q And whether - he may have been mistaken about that but
- (25) that s what he believed at the time is that true?
- (26) A That s correct
- (27) Q And that s what you believed at the time?

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- (1) A Uh huh
- (2) Q And what I was saying is that the - that process had
- (3) developed using this system of aerial surveys so that whatever
- (4) the actual number of fish that were getting up the stream the
- (5) feeling of the biologist was it wasn t enough?
- (6) A I don t think that is - is accurate I think that what we
- (7) were concerned about was that the wild stock were just not
- (8) enjoying good manne survival and some other things were
- (9) going
- (10) on not the level of escapements We were achieving what the
- (11) program had identified as an optimum escapement just you
- (12) know
- (13) based on the - the escapement goals were derived from ground
- (14) surveys originally
- (15) Q Right.
- (16) A And then the index program was kind of masked - matched
- (17) to
- (18) that and so we felt through those years that we were providing
- (19) an adequate number of spawners so it wasn t a lack of
- (20) spawners
- (21) that - that was causing the problem
- (22) Q Isn t it true Mr Parker that the reason they closed the
- (23) commercial fishery and migration corridors in 1988 was to make
- (24) sure that enough fish got up the stream?
- (25) A Oh absolutely
- (26) Q Isn t it?
- (27) A We were faced with a very weak forecast for 88 and it
- (28) turned out that way and the hatchery returns were weak There
- (29) was good reasons to restrict that fishery

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- (1) Q And that was because they didn t think they were getting
- (2) enough spawners?
- (3) A And they didn t They got 900 000
- (4) Q They didn t make it right?
- (5) A Right
- (6) Q And in going into 89 they were concerned Mr Brady was
- (7) concerned to make sure that he herded to the extent you can
- (8) herd fish that he made sure that enough fish got back there to
- (9) meet the goals which your department set to protect the
- (10) resource?
- (11) A In 89 we were looking at a 48 million return in our
- (12) forecast a 41 million harvest In 88 we were looking at a
- (13) 16 and a half million return to Prince William Sound You ve
- (14) got a world of difference here between 88 and 89
- (15) Q I grant you that your - that your forecasts start going
- (16) into the season was bullish but you still - did that make you
- (17) any less concerned that you wanted the fish to get back there
- (18) to spawn?
- (19) A No but what you re - what you re saying is that - you re
- (20) characterizing 1989 as a normal fishery
- (21) Q No sir I haven t characterized -
- (22) A And you re reacting to the run as it was developing and
- (23) making a terminal fishery In 89 that was not the case We
- (24) simply had that area closed the entrance areas closed to
- (25) commercial fishery and we had to rely on the inner areas to

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- (1) assess that run along with the escapement object - escapement
- (2) program which is not designed to enumerate every last salmon
- (3) that enters the systems
- (4) Q All I was asking you had nothing to do yet - I m going to
- (5) ask you about the 89 season because right now that s not where
- (6) I m going I m just trying to find out if it isn t true that
- (7) if your 1991 data is correct that the escapement goals that
- (8) you had been using in Prince William Sound over a period of 20
- (9) years were based on the number of fish that result from the
- (10) survey count whatever that number turns out to be isn t that
- (11) true?
- (12) A The escapement objective was originally developed from
- (13) ground surveys of the spawning beds to an assessment to
- (14) understand how many fish could be held within that spawning
- (15) bed
- (16) Q And then for 20 years you used aerial surveys and index
- (17) streams to set a target correct?
- (18) A Yes
- (19) Q And that target was if I can use a term of art
- (20) somewhat - was it about 300 000? What was the escapement
- (21) goal do you remember?
- (22) A It s 1 350 000
- (23) Q 1 350 000 per survey per aerial survey fish correct?
- (24) A Oh no that s - I m sorry that is the total index for
- (25) all of the index streams

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- (1) Q Right
- (2) A That s the desired amount of fish
- (3) Q Mr Brady was looking for his surveys to total up to that
- (4) number was he not?
- (5) A That s correct
- (6) Q Okay and -
- (7) A At the end of the season
- (8) Q And in 1989 we learned that that number really wasn t 1 3
- (9) million according to you it was five million right?
- (10) A (Nods head up and down)
- (11) Q But that same undercounting was occurring in 88 87
- (12) right?
- (13) A Yes
- (14) Q And those fish were going -
- (15) A Well no not in 88
- (16) Q Because you think it varied by even and odd year
- (17) A That's what the research indicated and that s what they
- (18) believed
- (19) Q But you do agree that the observers were different in 91
- (20) than they were in 88?
- (21) A Some of them
- (22) Q And you do agree that your own research indicates that
- (23) observer - the difference between individuals can range from
- (24) 38 to 77 percent?
- (25) A In the study that was conducted in Prince William - in

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- (1) Southeast Alaska that was the indication
- (2) Q Now at least in odd years that would have been the case
- (3) even by your algorithm?
- (4) A I m not sure what you mean by that statement
- (5) Q That if the 1991 overcounting data is correct then the
- (6) same overcounting was occurring in years prior It wasn t only
- (7) in 1989 that this error allegedly occurred?
- (8) A That s correct That s the belief of the Department of
- (9) Fish & Game when they went back and corrected their historical
- (10) data base on escapements
- (11) Q Now your view as to what would have happened in 1989 if
- (12) there had been no oil spill is that there would have been
- (13) commercial openings down in those corridors correct?
- (14) A Yes
- (15) Q And that when those commercial openings occurred
- (16) somehow
- (17) Mr Brady would have been - received the confidence to - to
- (18) not close to protect the wild runs not pull back as he did in
- (19) 1988?
- (20) A I think it s more probable than not that had Mr Brady been
- (21) given the opportunity to test the strength of that run with a
- (22) commercial fishery that he would have and the department
- (23) would
- (24) have realized that run was stronger and they would have
- (25) harvested the surplus
- (1) Q Now isn t it the case Mr Parker that even in hindsight
- (2) it turns out that the department was quite wrong in its

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- (1) forecast?
- (2) A That s correct.
- (3) Q The - even your reconstruction after the fact falls far
- (4) below what the department was forecasting?
- (5) A That s correct.
- (6) Q So this test fishery probably would have shown them
- (7) something about the fact that the run wasn t as strong as they
- (8) thought it was correct?
- (9) A That s correct
- (10) Q And they were according to your reconstruction even more
- (11) wrong in their estimate of the wild escapement?
- (12) A I believe so I believe so
- (13) Q And in using the best tools that they had available to them
- (14) at the time that is the aerial surveys the aerial surveys
- (15) indicated a weak wild stock return in 1989 isn t that true?
- (16) A Indicated where?
- (17) Q Weak wild stock returns in the index streams?
- (18) A They - they ended up with - with between 40 and 60
- (19) percent above their escapement objectives in the southwestern
- (20) Montague and Eshamy districts so they ended up with
- (21) escapements above their objectives in 1989
- (22) Q Doesn t your report indicate that the managers became
- (23) concerned by initial weak run wild run returns?
- (24) A Where they were fishing which was in the eastern and
- (25) southeastern districts which is the early run component up

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- (1) towards Valdez the upper corner of Prince William Sound
 (2) Q And in the places where they - in the places where they
 (3) exceeded their escapement goal there was no fishing at all
 (4) correct?
 (5) A That s correct
 (6) Q And so there was absolutely no interception of wild stock
 (7) there?
 (8) A That s correct
 (9) Q So if there had been these test fisheries or this initial
 (10) fishing the only possible effect that that could have had is
 (11) to reduce the number of fish wild fish that could get back to
 (12) the wild streams from which they originated isn t that true?
 (13) A A portion of the mixed stock would have included fish from
 (14) the northern portion of Prince William Sound
 (15) Q The answer is yes?
 (16) A That was my answer
 (17) Q Yes?
 (18) A Well my statement is the mixed stock fishery that would
 (19) have occurred in the southwestern district would have included
 (20) components from the northern and southeastern and eastern
 (21) districts likely Some component I m not sure what the
 (22) proportion is You have to get into the tagging data from
 (23) recent years to really break that down
 (24) Q Mr Parker what I m trying to get at is if you take fish
 (25) and put them into one of these big nets that we saw yesterday

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- (1) take a thousand or 2 000 fish and you put them into one of
 (2) those nets by and large they re not going to return either to
 (3) the hatchery or to the wild stream right?
 (4) A Not unless you let them go again
 (5) Q There s nothing about catching fish that will increase the
 (6) number of fish that get back to the streams for spawning
 (7) purposes is that correct?
 (8) A A dead fish is a dead fish
 (9) Q Right So if they had sat on those fish as you said in
 (10) the migrating corridors the only effect that would have is to
 (11) reduce the escapement to wild streams?
 (12) A Potentially
 (13) Q Now if in Mr Brady s judgment the aerial survey data that
 (14) he was seeing in 1989 required him to confine the fishery to
 (15) the special terminal catching areas by the hatcheries it was
 (16) his duty to do that was it not?
 (17) A He was responsible to implement the management plan and
 (18) if
 (19) he saw a situation that he thought the fishery had to be
 (20) totally restricted given a normal situation normal fishery
 (21) without any influence from oil and the resulting management
 (22) actions that were necessary from the MOU and he judged that
 (23) that resource needed protection he would restrict the fishery
 (24) to areas where he felt it would - would harvest the surplus
 (25) and let the escapement the other fish escape the fishery if
 (26) it was - if he could do that

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- (1) Q He had that responsibility?
 (2) A Yes
 (3) Q And the technique or strategy that you had used in
 (4) developing your department for doing that was to restrict the
 (5) pink salmon fishery to areas near the hatcheries?
 (6) A Again we get into semantics Restrict the fishery to
 (7) areas near the fish - near the hatchery that can be anything
 (8) from shoving the fishery into a very confined space in the
 (9) terminal harvest area versus using a subdistrict to
 (10) concentrate harvest in areas adjacent to hatchery So you see
 (11) the problem I m having is semantics You know you can take
 (12) that terminal fishery phrase it means different things It s
 (13) not a simple simple phrase to apply
 (14) Q I didn t use that phrase I just asked if it isn t the
 (15) case that your department had evolved the strategy over the
 (16) mid
 (17) 80s of creating these special harvesting areas near the
 (18) hatcheries in order to protect the wild hatchery - stock I
 (19) mean?
 (20) A The wild stock
 (21) Q The pink salmon stock?
 (22) A Right I understand
 (23) Q And that s what Mr Brady had done in the 1988 season
 (24) correct?
 (25) A Yes
 (26) Q After this initial chum fishery correct?

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- (1) A Yes
 (2) Q And in 1989 if in his judgment the aerial survey data
 (3) indicated that again the run was weaker than your guidelines
 (4) indicated his responsibility as official of ADF&G was to
 (5) protect the resource?
 (6) A If he - if he felt that that was required he d have to
 (7) take that action
 (8) Q And that basically in the figures that you ve given the
 (9) jury reconstructing what you think the 1989 run would have
 (10) been - correct - you re making the assumption are you not
 (11) that somehow Mr Brady would have been able to foretell in
 (12) 1989
 (13) that his aerial survey data were overcounting - undercounting?
 (14) A No I m not
 (15) Q Are you making the -
 (16) A What I m saying is that if he had been given the
 (17) opportunity to harvest fish in that southwestern corner of the
 (18) Sound there would have been an indication a run much
 (19) stronger
 (20) than what was being indicated in the index program and those
 (21) fish would have been for commercial catch
 (22) Q And the indication - he wouldn t have any way to know from
 (23) that whether the fish pulled up were hatchery fish 90 percent
 (24) hatchery fish 99 percent hatchery fish or the opposite
 (25) correct?
 (26) A If memory serves me correctly I think we had the hatchery
 (27) production tagged and I know we did in 88 and I m trying to

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- (1) recall if we did in 89 I think we did
 (2) Q Isn't it your testimony that there's no way to use tagged
 (3) data on an inseason basis?
 (4) A It's difficult. You'd have to do that post season.
 (5) Q He couldn't have done anything with a tag information?
 (6) A No, he'd have to rely on the commercial catch.
 (7) Q All he'd know from the commercial is fish were being
 (8) caught?
 (9) A That's correct.
 (10) Q He wouldn't know whether they were hatchery fish or wild
 (11) fish?
 (12) A They also use the information about where the fish are
 (13) being caught. They have harvest patterns that are repeated
 (14) year after year in certain districts and subdistricts, and they
 (15) kind of get a feeling for whether they're hammering wild stocks
 (16) or hatchery stocks. It's kind of a - you know something
 (17) that's developed after years of managing the same fishery.
 (18) Q But your - go back to the question I started to ask.
 (19) MR LYNCH I'm a little past 10. Your Honor, should I
 (20) finish?
 (21) THE COURT How close are you to finished?
 (22) MR LYNCH Depends on -
 (23) THE WITNESS What my answers are.
 (24) MR LYNCH I think I'm pretty close. Your Honor.
 (25) THE COURT Let's finish it up.

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- (1) BY MR LYNCH
 (2) Q Your reconstruction of the harvest adds four fish for the
 (3) one fish of the aerial counting. Is that correct?
 (4) A That's correct.
 (5) Q It's assumed that those fish would have been caught by the
 (6) commercial fisherman rather than escaping?
 (7) A That's my assumption.
 (8) Q Because once the fish gets into the stream to be counted by
 (9) that aerial survey, it can't be caught anymore any way?
 (10) A That's correct (check (ck) that for me I think I need a
 (11) /TPHEG /TEUF not a positive back there).
 (12) Q So your escapement that was seen in the wild stock would
 (13) have been - the biologist would have been willing to accept a
 (14) substantially lower - about a 25 percent escapement per aerial
 (15) survey?
 (16) A Well, I'm not sure that - that they would have seen the
 (17) difference. See that's the problem with this error. You get
 (18) into a situation in season - if you've got a tremendous amount
 (19) of fish in there, it's very difficult to estimate what's there
 (20) and that's the problem with this upstream distribution of
 (21) spawners in odd years. You just can't tell for sure.
 (22) Q Can't tell, and so you have -
 (23) A Cannot tell to the - down to the last fish.
 (24) Q And when in doubt, you protect the resource?
 (25) A Yeah.

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- (1) Q And the tools that you do (ck) about were the aerial
 (2) counts?
 (3) A Yeah.
 (4) MR LYNCH No further questions, Your Honor.
 (5) THE COURT We'll take our recess at this point.
 (6) Ladies and gentlemen, We will be in recess for 15 minutes.
 (7) (Jury out at 10:04)
 (8) (Recess from 10:04 to 10:17 a.m.)
 (9) (Jury in at 10:19 a.m.)
 (10) THE COURT Mr. O'Neill?
 (11) REDIRECT EXAMINATION OF KENNETH P. PARKER
 (12) BY MR. O'NEILL.
 (13) Q Why are we placed in a situation in which we have to do a
 (14) forecast?
 (15) A Why are we placed in a situation where we have to -
 (16) preseason - where we have to go back?
 (17) Q No, no, let me - why are we placed today in a situation to
 (18) where we have to go back and reconstruct the run size?
 (19) A Very simply because the fishery was interfered to a very
 (20) major degree and we were not allowed to harvest in our
 (21) dominant
 (22) harvest area in Prince William Sound and as a consequence
 (23) the
 (24) accurate counting of the - of what was entering into the
 (25) Prince William Sound was to a very large degree left to the
 (26) index program, which is never envisioned to accurately
 (27) enumerate every salmon in those streams.

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- (1) Q What interfered with the conduct of the fishery in 1989
 (2) that requires us to go through this process?
 (3) A It was the oil from the Exxon Valdez that kicked in the MOU
 (4) and required the department to - to summarize close those
 (5) districts.
 (6) Q Now, the MOU reflects attention between overescapement
 (7) and
 (8) the need not to have oiled fish get on the market?
 (9) A Now, the - the MOU could in some situations result in
 (10) escapements exceeding desired levels. That was just a product
 (11) of having to react to the oil and restrict fisheries which
 (12) would normally intercept these runs and whittle them down.
 (13) Q So the -
 (14) A But in some situations that didn't occur, so you get masses
 (15) of fish entering the streams and potentially causing harm.
 (16) Q But we normally don't have an MOU?
 (17) A That's correct.
 (18) Q And why did we have an MOU?
 (19) A Only because of the Exxon Valdez oil spill.
 (20) Q Mr. Lynch asked a question as to whether anybody on your
 (21) staff gave the opinion that this was an opportunity to view at
 (22) low or no cost an experiment with regard to overescapement or
 (23) words to that effect. Do you recall the questions?
 (24) A Yes, I do.
 (25) Q Was that the department's policy?
 (26) A Absolutely not.

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- (1) Q With regard to Sam Scharr's research that you relied on to
 (2) make your run size estimates who did Mr. Scharr do that work
 (3) for?
 (4) A He was the research project leader for Bristol Bay and he
 (5) undertook those studies with fund - State of Alaska funds
 (6) He's a State of Alaska Department of Fish & Game research
 (7) biologist so he accomplished it for the State of Alaska
 (8) Q And as a result of Scharr's work the State of Alaska
 (9) Department of Fish & Game has gone back and readjusted their
 (10) historical data using Mr. Scharr's work?
 (11) A They have I have seen a preliminary version They have
 (12) not published that yet
 (13) Q I want to talk a little bit if we could about the
 (14) progress of the fishery in 1989 and I'm going to use as an
 (15) example the Upper Cook Inlet fishery With regard to the Upper
 (16) Cook Inlet management area the people who manage that
 fishery
 (17) were they able to say on July 1 or on the first day of the
 (18) fishery this is what the situation is going to be with regard
 (19) to the fish and the oil and here's what our plan is or is it
 (20) an evolving process?
 (21) A No I think the oil that entered the upper subdistrict of
 (22) the central district of Upper Cook Inlet was never
 (23) anticipated We did not think at the beginning of the season
 (24) that we were going to have a problem in Upper Cook Inlet with
 (25) oil So we kept the fleet on call pretty much down to the last

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- (1) minute to because we didn't know that - how long it was
 (2) going to stay or even if it was going to show up
 (3) Q And as the season evolved through June 25th on to the end
 (4) of July that was in point of fact reevaluated on a day-to-day
 (5) basis wasn't it?
 (6) A Yes it was We had test fish vessels commercial fishing
 (7) vessels out in the central district looking at the rips
 (8) testing the rips to see what was happening with the mousse
 (9) patties that were floating into Upper Cook Inlet
 (10) Q You're going to have to tell them what the rips are
 (11) A Yeah in Upper Cook Inlet of course we have tremendous
 (12) tides I think in the Anchorage area the maximum is like 32
 (13) feet It's pretty amazing Anyway there are areas where
 (14) tides tidal currents are moving in opposition to one another
 (15) and debris and floating detritus everything tends to
 (16) accumulate on the two rips where everything is passing one
 (17) another so they form long trails of junk Of course that's
 (18) where the oil tended to accumulate also but it's also the
 (19) preferred place to fish You get off to the side of one of the
 (20) rips and set because that's also where the fish seem to be
 (21) abundant when you're commercial fishing
 (22) Q And in point of fact throughout the summer of 1989 the
 (23) department sent out boats to see if in fact you could fish?
 (24) A That's correct Under the terms of the MOU the department
 (25) was responsible to send out vessels and test the fishery to see

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- (1) if there was a potential for opening the fishery
 (2) Q So the department did its best to see if you could have a
 (3) commercial fishery?
 (4) A That's correct
 (5) MR O NEILL I have nothing further Thank you
 (6) sir
 (7) THE COURT Thank you Mr. Parker
 (8) MR O NEILL Plaintiffs call Don Rogers
 (9) MR LYNCH Brian - Your Honor may we come to the
 (10) side bar?
 (11) (At side bar off the record)
 (12) THE COURT I thought that had something to do with
 (13) you and it doesn't
 (14) DR ROGERS It doesn't? Good I'm relieved
 (15) THE CLERK. Would you stand sir and raise your right
 (16) hand?
 (17) (The Witness Is Sworn)
 (18) THE CLERK Please be seated For the record sir
 (19) state your full name your address and spell your last name
 (20) please
 (21) THE WITNESS Donald E Rogers R-o-g-e-r-s and I
 (22) live at 8039 23rd Northwest Seattle Washington
 (23) DIRECT EXAMINATION OF DR DONALD E ROGERS
 (24) BY MR O NEILL
 (25) Q Dr Rogers what do you do for a living?

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- (1) A I'm a professor at the University of Washington School of
 (2) Fisheries
 (3) Q What do you teach?
 (4) A I do mostly research but I've taught courses on sampling
 (5) gear fishing gear I'll be teaching a course of Alaska salmon
 (6) management research this coming fall
 (7) Q And how do you spend your year? Where do you live during
 (8) the course of an average year?
 (9) A I spend nine months in Seattle and three months in Alaska
 (10) mostly in Bristol Bay
 (11) Q And for how long have you spent those three months in
 (12) Alaska?
 (13) A 35 years
 (14) Q Are you married?
 (15) A Yes My wife works with me and is also a fisheries
 (16) biologist.
 (17) Q So you guys can like sort of sit around and talk fish?
 (18) A Kind of She's a bad employee I'll tell you
 (19) Q And what degrees do you have and where did you get them?
 (20) A I got a bachelors degree at Cal Poly in San Luis Obispo in
 (21) California and Ph D at University of Washington
 (22) Q What subject matters are your degrees in?
 (23) A Bachelors degree in biology and the masters and Ph D in
 (24) fisheries
 (25) Q Have you ever been qualified to testify as an expert

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- (1) witness in a courtroom before?
 (2) A Yes
 (3) Q And on what subject?
 (4) A The same subject
 (5) Q Same fishery?
 (6) A Well this time it's two fisheries Before it was just
 (7) Cook Inlet
 (8) Q Have you done any research with regard to Alaska salmon?
 (9) A Yes
 (10) Q And what research have you done?
 (11) A I've studied salmon and salmon fisheries in every major
 (12) fishery in the State except Prince William Sound
 (13) Q And does that include Cook Inlet and Kodiak?
 (14) A Yes
 (15) Q What is the Point Moller test fishery in Bristol Bay?
 (16) A That's a test fishery to predict the Bristol Bay salmon run
 (17) about one week in advance of its arrival it's going on right
 (18) now
 (19) Q And do you run the test fishery?
 (20) A Yes
 (21) Q For how long have you run the test fishery?
 (22) A Since 1987
 (23) Q And have you done any work with the Alaska Department of
 (24) Fish & Game?
 (25) A Yes on several occasions

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- (1) Q What kind of work do you do with the Alaska Department of
 (2) Fish & Game?
 (3) A Well in the past during the 70s I conducted lake
 (4) fertilization studies for the department stock separation
 (5) studies on Yukon and high sea salmon I'm involved at the
 (6) Department of Fish & Game studying a statement of goals and
 (7) management policy in Bristol Bay and False Pass
 (8) Q Do you participate in board of fisheries meetings?
 (9) A Annually since 1986
 (10) Q What do you do in the board meetings when you participate?
 (11) A I testify
 (12) Q On what subjects?
 (13) A It's been False Pass every year since 86
 (14) Q So you're the problem?
 (15) A I guess so
 (16) Q You're not part of the solution Do you do fisheries
 (17) research yourself hands-on fisheries research?
 (18) A Yes
 (19) Q Would you explain the kinds of fisheries research hands-on
 (20) fisheries research that you've been involved in let's - with
 (21) regard to salmon?
 (22) A All phases of salmon I've been involved with studies from
 (23) spawning, fry smolt migrations high seas distribution and
 (24) migrations the whole thing
 (25) Q Have you used standard fishing gear in your career?

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- (1) A Yes
 (2) Q And would you tell us in what roles you've used it?
 (3) A Well we - we use beach staining as a sampling tool in
 (4) lakes I've done all sampling for salmon I've done purse
 (5) seining gillnetting beach seining I've not done dipnetting
 (6) but that's not used commercially
 (7) Q Have you done any work on the Nushagak River?
 (8) A Yes
 (9) Q Would you explain to us the work you've done on the
 (10) Nushagak River?
 (11) A Relative to this situation here I made a study of the
 (12) estimation of escapements in the Nushagak River by sonar
 (13) compared to tower counts
 (14) Q And have you done any work on the Susitna River?
 (15) A Yes I examined reports on estimation of sockeye and
 (16) chinook salmon escapements in the Susitna River
 (17) Q Have you done any work for the National Marine Fisheries
 (18) Service?
 (19) A Yes in the past years in the 70s I was involved with
 (20) them in negotiations with the Japanese on high seas fishing
 (21) Presently the only work I do with them is they sponsor
 (22) research that we conduct or I conduct at Chignik Chignik's on
 (23) the Alaska peninsula
 (24) Q Have you done any work concerning the outer continental
 (25) shelf and fisheries and the environmental impact of oil

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- (1) development?
 (2) A Yes in the late 70s I had a project that lasted three
 (3) years on extensive sampling around Kodiak Island because
 (4) they
 (5) were - potentially going to drill for oil there so it was a
 (6) part of environmental impact statement and then in 84 and 85
 (7) similar studies on the abundance and distribution of fish on
 (8) the north side of the Alaska peninsula where they also and I
 (9) guess still are considering oil development
 (10) Q With regard to the Point Moller test fishery which you run
 (11) who funds that work?
 (12) A Salmon processors I think it's about nine companies now
 (13) Q Have you done any work estimating stock abundance?
 (14) A Yes every year
 (15) Q And counting fish?
 (16) A Yes
 (17) Q Have you ever done an aerial survey?
 (18) A Yes
 (19) Q Have you ever done a tower count?
 (20) A Yes
 (21) Q Have you ever done a foot survey?
 (22) A Many
 (23) Q Have you ever worked with a weir?
 (24) A I've visited weirs I've never counted at a weir
 (25) MR O NEILL. We would offer Dr Rogers as an expert
 on Alaska salmon fisheries and on stock abundance and on the

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- (1) subject of fisheries management
 (2) MR NEAL No questions Your Honor at this time
 (3) THE COURT Court accepts Dr Rogers qualifications
 (4) on those subjects
 (5) MR O NEILL Thank you Judge
 (6) BY MR O NEILL
 (7) Q Would you give us if you could very briefly some
 (8) historical background on the management of Alaska salmon
 (9) fisheries?
 (10) A Yes during federal times during the 20s 30s 40s and
 (11) early 50s salmon runs were managed with the objective of
 (12) taking about half of the fish one for the can one for the
 (13) spawning grounds That was the rule in fact during the 20s
 (14) and 30s and essentially that carried on into the 50s
 (15) although that wasn't what they said they were doing
 (16) Since about the early or mid 60s when we started
 (17) developing data bases on salmon runs catch plus escapement
 (18) since that time to the present most of the important salmon
 (19) runs are managed now on the basis of spawn to return
 (20) relationships we plot the number of fish that return from
 (21) given escapement numbers establish relationship between
 those
 (22) two things look for a place on that what becomes a curve
 (23) where you would get the most fish on the average that
 (24) escapement that you would get the most fish on the average all
 (25) right Maximum sustained yield is what it's called a fancy

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- (1) term
 (2) Then that's called an escapement goal and for most of the
 (3) major fisheries in the State since 1960s 1970s the department
 (4) has established these escapement goals and therefore as a
 (5) salmon run comes in they try to judge the abundance of that
 (6) run and they try to harvest all the fish in excess of that
 (7) escapement goal and get that escapement goal up the river to
 (8) produce future runs
 (9) Q And what is the limited entry permit system?
 (10) A Limited entry permit system was the - came to Alaska in
 (11) the early 1970s and the reason was is that it's typical with
 (12) all fisheries if a fishery is doing real well it attracts
 (13) other fishermen So if you start with a fishery and fishermen
 (14) making money they start with a hundred next thing you know
 (15) there's a thousand and everybody's broke Not just true of
 (16) salmon true of other fisheries So money attracts people
 (17) So what the State did in the early 70s very wise move
 (18) they froze the number of boats or number of permits call
 (19) them You had to have a permit So if you had been fishing
 (20) for several years in Bristol Bay or Cook Inlet you were
 (21) eligible to get a permit whatever year it was 72 73
 (22) something like that
 (23) Now today those permits have value because you can't - I
 (24) can't just go out or none of you can just go fish in Cook
 (25) Inlet You have to have a permit Therefore you have to buy

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- (1) that permit from somebody who has them It's a fixed number
 of
 (2) boats 500 thousand whatever it is in each fishery That's
 (3) limited entry and it's worked very well
 (4) Q Would you briefly describe for us - I did it in the
 (5) opening very inarticulately but could you tell us briefly what
 (6) the life cycle of the red salmon is and what the life cycle of
 (7) the pink salmon is?
 (8) A I think Ken Parker talked about the pink salmon That's
 (9) simple They - all salmon spawn in the fall start with the
 (10) spawning That's August September some October here in
 (11) central and southwest Alaska All right and they all - the
 (12) eggs incubate during the winter and hatch in late winter
 (13) February March something like that. But the alevin that's
 (14) what we call the fish that hatch out have the yolk sacs on
 (15) them and they stay in the gravel until spring and the timing is
 (16) all - they've worked it out almost perfect so they emerge from
 (17) the gravel after the ice goes out and there's food to eat.
 (18) Something that fools them we have a late spring that's
 (19) bad news They're on a time clock so to speak They come out
 (20) and if the ice is still there they're in trouble Late
 (21) springs are uncommon We had one in 1971, late spring
 (22) By and large, that works pretty fine From that point on
 (23) the life history of the various species - five species of
 (24) salmon differ Pink salmon go right to sea Don't spend much
 (25) time in fresh water Most spawn near saltwater in tributary

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- (1) streams That's what they're adapted for They go right to
 (2) sea
 (3) Chum salmon also go right to sea Difference between those
 (4) two pink salmon have a very fast growth rate come back after
 (5) a year and a half at sea or two years after their parents
 (6) Chum salmon spend two three four or even five years at sea
 (7) before they return That's those two
 (8) The sockeye salmon is the salmon most associated with
 (9) lakes although there are sockeye in river systems in the
 (10) sloughs in the river They're the salmon most associated with
 (11) lakes also the salmon that spend the most time in fresh water
 (12) and typically you have - there's a variety of age
 (13) combinations but the prominent four are fish that spend one
 (14) year in fresh water two or three years at sea that gives two
 (15) groups and then two years in fresh water or then two and three
 (16) years at sea So we have those four possible age classes that
 (17) come back Each salmon - how much more -
 (18) Q Go ahead
 (19) A Is that enough?
 (20) Q Well they go out to the ocean They haven't come back
 (21) yet?
 (22) A Oh I see Okay after the one to two years at sea they
 (23) go to sea they go to sea in spring very precise time each
 (24) stock timing of the spring migration For example the Lake
 (25) Illiamna which is the largest sockeye population in the world

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- (1) those smolts go to sea in a two week period numbers up to four
 (2) to five sometimes five hundred million two weeks river s just
 (3) black with fish They can boom out The reason for that is to
 (4) overwhelm the predators you see You ve got essentially a
 (5) gauntlet of predators these fish have to go through fish
 (6) birds seals the whole thing and by going out in mass the
 (7) predators can only eat so much in a day and that s why we
 (8) believe salmon migrate that way
 (9) This also applies to adults I ll say that that they tend
 (10) to come back in a very short time
 (11) So the fish go to sea the sockeye go to sea and when they
 (12) go to sea they re about four inches long typically hundred
 (13) millimeters about four inches long Once they go to sea they
 (14) have a - each stock the Bristol Bay stock Cook Inlet stocks
 (15) Kodiak have a particular unique ocean distribution
 (16) The for example Kodiak and Cook Inlet sockeye salmon rear
 (17) in the Gulf of Alaska Very few get out to the ocean area
 (18) Bristol Bay stocks extend from off Yakutat all the way over to
 (19) the - almost the extreme part of the end of the ocean near
 (20) Amchitka because there s so many of them We have runs of 40
 (21) million 50 million sockeye in Bristol Bay They have a very
 (22) broad ocean distribution
 (23) Now what happens the fish make annual - when they re at
 (24) sea they make annual migration in a kind of counterclockwise
 (25) movement and also when they re at sea in the winter they drop

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- (1) south off the shelf So you usually don't see many salmon in
 (2) the Bering Sea or on the coast south side around Kodiak
 (3) They re south in warmer water in the winter
 (4) In the spring they start moving north When they move
 (5) north they move north in the definite progression of the older
 (6) and larger first and younger and smaller fish bringing up the
 (7) tail end When the fish has matured after it s spent say two
 (8) years at sea and it s old enough and large enough to mature
 (9) then as it moves south in that spring it continues on and
 (10) comes home in a very unbelievable migration in a way I mean
 (11) you figure a fish can be off Yakutat and make its way back to
 (12) some Bristol Bay river in a matter of a month
 (13) Q In managing a fishery what temporal tools does a fisheries
 (14) manager have available to him or her?
 (15) A Salmon fisheries are managed first by setting out
 (16) geographical boundanes to the fishing what we call fishing
 (17) districts and the objective here is - you heard about
 (18) terminal fisheries Well the objective is to try to have the
 (19) fishery as close to where a group of fish are going, the river
 (20) for example as practical and so in a place like Chignik where
 (21) there s a river and there s a lagoon the fishery can be right
 (22) in the lagoon right off the mouth of the river That s where
 (23) they have the fishery don t have it out in the Gulf of
 (24) Alaska
 (25) In the case of Bristol Bay there s the Kvichak Bay and

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- (1) Nushagak Bay and those become fishing districts but multiple
 (2) stocks in those districts They try to - that s the objective
 (3) first the geographic Cook Inlet there s no bay Kenai River
 (4) those empty in there s no bay or anything have a broad
 (5) fishing district there
 (6) After establishing the fishing districts - that s one
 (7) tool and you can move the fleet around from one district to
 (8) another The main thing that s used is openings and closings
 (9) of the fishery Fisher s allowed to fish for 12 hours one day
 (10) and close for two weeks or whatever depending on the size of
 (11) the run Size of the run is an important thing So first you
 (12) have - we make preseason forecasts I make preseason
 (13) forecasts in October for the next year s run and these are
 (14) lousy by and large
 (15) The next thing we have though and important is inseason
 (16) forecast and that s - you mentioned Point Moller We used
 (17) that for Bristol Bay In Cook Inlet, there is a test fishery
 (18) called Anchor Point line and that - the management uses that
 (19) test fishery They go out and fish with the same gear
 (20) hopefully in the same way every year every day prior as the
 (21) fish are coming in and they look at the catch average catch
 (22) essentially They call it catch per unit effort but the
 (23) average catch and that gives the manager a guide does this
 (24) look high low whatever as far as the number of fish coming
 (25) in

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- (1) The next thing that the manager uses and by far the best
 (2) thing is the first fishing period when you have the whole
 (3) fleet out there what their average catch is and then the
 (4) manager compares that catch for example what will happen
 (5) this
 (6) year look at the first opening look at the catch say they
 (7) caught 200 000 look back he s got a record of past years
 (8) there was a catch in the first period one year was 400 000 we
 (9) had a run of ten million There was a catch of 50 000 we got
 (10) a run of two million So they simply do matching up very
 (11) simple thing but very valuable tool is when the whole fleet
 (12) fishes
 (13) Q Are there any other tools that the -
 (14) A Oh yes Then as we proceed - very early that s what
 (15) they have Then as we go on and the fish have been in the
 (16) fishing district and some start going up the rivers that s
 (17) another thing they start watching They make counts of the
 (18) fish as they re going up the rivers and they compare those
 (19) counts to past years same date so forth That gives them
 (20) some more information but that s as you get a little further
 (21) along in the run
 (22) Q How about the commercial catch through the season does
 (23) that help?
 (24) A That helps right on Further along you are the more you
 (25) know of course
 (26) Q I m going to want you to talk about two specific

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- (1) fisheries Mr Parker talked about Prince William Sound
 (2) Let's have you talk about the Upper Cook Inlet fishery And
 (3) I'm going to pull up Plaintiffs Exhibit 304 which is in
 (4) evidence With regard to this exhibit could you just describe
 (5) for us from a fisheries perspective what we see on this map?
 (6) A All right These dashed lines that we see here are the
 (7) division lines between fishing districts within Cook Inlet
 (8) Upper Cook Inlet That test fish that I talked about at Anchor
 (9) Point is right along here just as the fish entered the lower
 (10) fishing district of Upper Cook Inlet
 (11) All right so this means that the manager can say well
 (12) I - the lower district is closed but you can fish over here
 (13) and so forth That's why talking about these districts the
 (14) manager can push the fleet around Now the fleet I'm talking
 (15) about that can move around is the drift gillnet That's the
 (16) fishermen fishing gillnets from a boat and they can move the
 (17) boat around and fish with a boat. Drift gillnet fishermen in
 (18) Upper Cook Inlet can fish only from - from here up to here
 (19) They can - they can fish in here This upper district here is
 (20) only - has setnets and that's the other type of gear used in
 (21) Upper Cook Inlet
 (22) Typically setnets are - they're fixed They can't move
 (23) around They own the site and usually they're right off the
 (24) shore but in Cook Inlet they have some further off than just
 (25) right off the beach

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- (1) Q And what are the major river systems in Cook Inlet?
 (2) A Cook Inlet has four major sockeye systems Kaslof Kenai
 (3) Susitna River up here and Crescent River up here Of those
 (4) the Kenai River has by far the largest runs in recent years
 (5) Q How are the fish counted in Upper Cook Inlet?
 (6) A They're counted by sonar counter in each of those four
 (7) river systems in the trunk streams Well in the trunk stream
 (8) in three of them and in the Susitna River the sonar is located
 (9) on a tributary only of the whole river
 (10) Q Now what I'd like you to do using Plaintiffs Exhibit 305
 (11) the same thing for the Kodiak management area
 (12) A All right Again you see these dashed lines separate out
 (13) major fishing districts around Kodiak Kodiak has two types of
 (14) fishing gear purse seines and set gillnets No drift
 (15) gillnets The set gillnet fishery is mainly for sockeye
 (16) mainly located near Alitak Bay in Alitak district and setnets
 (17) located inside Purse seiners in Kodiak fish all around and
 (18) usually on the capes and they catch - their fishery for
 (19) sockeye in the sockeye systems here Alitak Bay Frazer Lake
 (20) Red River right here is a major one and the Kariuk River So
 (21) there's an upper station about four major sockeye systems but
 (22) by far Red River Kariuk and Frazer Lake are the big ones So
 (23) the seiners catch fish sockeye bound for those systems fishing
 (24) outside off the capes I think they're fishing Alitak Bay but
 (25) not up inside

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- (1) The other major fishery though big fishery at Kodiak are
 (2) pink salmon fisheries and here I can't put any stream on
 (3) There's almost 400 streams that have pink salmon in Kodiak
 So
 (4) there the fishery term the management is by regions common
 (5) fisheries returning and number of small streams in regions and
 (6) that occurs the larger pink salmon fisheries on the inside
 (7) and smaller ones on the Shelikof Strait
 (8) There's also in recent years I don't know which one is
 (9) Kroi Bay Kroi Bay Afognak Island is a hatchery that
 (10) produces pink salmon and recent years it's had some
 remarkable
 (11) success
 (12) Q We had a description about the different methods of
 (13) counting fish through Mr Parker so we won't go through that
 (14) I do want to ask you though why do you count the fish?
 (15) A Well it's absolutely necessary I said that the basis of
 (16) management is this relationship between number of fish that
 (17) spawn and the number of fish that they produced So we have
 to
 (18) know how many fish spawned if we're going to have a basis for
 (19) management That's from the standpoint of the - of the
 (20) managers or the Alaska Department of Fish & Game
 (21) In the case of a situation where fishermen can't fish as
 (22) what happened with this oil spill then the escapement becomes
 (23) important to estimate how much fish they would have caught
 (24) Q And that's what we're going to do here for Kodiak and Upper
 (25) Cook Inlet?

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- (1) A Right
 (2) Q Now I want you to go through if you would the different
 (3) methods of counting fish We don't need to describe them
 (4) again but go through the errors and the reason for the errors
 (5) associated with the different fish counting methods
 (6) A Okay Beginning with what we generally believe are the
 (7) most accurate methods that's the tower or weir and in both of
 (8) these methods you visually count the fish In neither one do
 (9) you count fish constantly including the weir The fish are
 (10) counted for 10 or 15 minutes then the fish go and then you
 (11) count again because if you kept somebody counting all the
 time
 (12) they'd go bonkers So all of them are given a sample counting
 (13) but this has been tested many times and it's very accurate
 (14) After the tower counting and the weirs we have sonar
 (15) counters which are used when you can't see the fish And
 (16) following that are the aerial surveys that Ken Parker talked
 (17) about
 (18) Now the problem - you want to know the problems with
 (19) these each one - I think each of these methods has a problem
 (20) with very large numbers including the tower and the weir If
 (21) you have solid fish moving through it's difficult to count
 (22) them and you tend to undercount but the undercounting as
 (23) we'll get into here is more severe I think with sonar by far
 (24) than it is with any tower or weir
 (25) Aerial surveys as Ken Parker talked about the problems

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- (1) there the difference from one observer to the other and the
 (2) fact that usually you are lucky to see half the fish if that
 (3) Q I want to talk about sonar counters because sonar counters
 (4) are used in Upper Cook Inlet Let me see if I can bring that
 (5) map back up Where are the - the sonar counters are on the
 (6) four major river systems?
 (7) A Right Well - here we go Crescent Kaslof Kenai and
 (8) then we have here the Susitna River this large river It has
 (9) a tributary the Yentna and there's a sonar on that
 (10) Q Now I'm going to talk about sonar and the first question
 (11) I'm going to ask you is what is the Nushagak study?
 (12) A The Nushagak River is in Bristol Bay In that river the
 (13) lower part of the river hundred miles or so water is muddy so
 (14) you can't see the fish It has a sockeye run other fish pink
 (15) salmon runs and chinook Main interest is sockeye and pink
 (16) salmon runs Problem is you can't count the fish until about a
 (17) week after they've been in the fishing district before they
 (18) reach clear water over a hundred miles upstream before the
 (19) water is clear
 (20) So there the Department of Fish & Game installed a sonar at
 (21) about 50 miles from the fishing district in muddy water and
 (22) this is originally put in in 1978 after some experimentation
 (23) and was to count the fish and had the advantage that it
 (24) would - it was only about a day from the fishing district and
 (25) gave them more - better information All right?

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- (1) Now it turned out that when they installed this the first
 (2) time in 1978 that they continued their tower counting that
 (3) they had been doing for years upriver into clear water So
 (4) this gave us two methods two estimates then one the tower
 (5) estimate which we felt to be accurate plus the sonar count
 (6) Fortunately they repeated this every year through 1988 so
 (7) this is the only test of the sonar as a method of estimating an
 (8) escapement up the river All right? Since we had each of
 (9) those years we had counted the sockeye from the tower
 compared
 (10) with what the sonar was counting and they were independent
 (11) And they did this for each of - for each of those years with
 (12) sockeye Pinks are only run in that river in even numbered
 (13) years so we have fewer number of years with pinks
 (14) Q This is an Exhibit Number 379 Plaintiffs' Exhibit Number
 (15) 379 and I want you to explain Exhibit 379
 (16) A All right You saw a regression before This is the same
 (17) thing The only difference is that the regression here is for
 (18) the curve to this rather than a straight line and that's
 (19) because that appears to be what's happening with these data
 (20) points They don't appear to increase linearly They appear
 (21) to increase curvilinearly
 (22) At the bottom is sonar escapement count. Each point is a
 (23) year Bottom is sonar for each year and up here the tower
 (24) count for the true escapement
 (25) For example in one year we had trying to line something

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- (1) up Here we go the sonar escapement was - these are in
 (2) thousands of fish so that's two million That year the true
 (3) escapement was really three million See that? Here's another
 (4) one true escapement was about three and a quarter million
 (5) where the sonar estimated only about between 1200 - I mean
 1 2
 (6) million
 (7) One thing we see here in the river when the escapements are
 (8) in this neighborhood about 500 000 up to a million the sonar's
 (9) fairly good It's undercounting but not by a whole lot The
 (10) serious problem is when the escapements that are very large
 the
 (11) sonar is underestimating the escapement by a considerable
 (12) amount and if there was - if the sonar was accurate these
 (13) points would all fall along this line or plus or minus around
 (14) this line then we'd be able to say the sonar and the tower
 (15) count are doing the same thing
 (16) Q Now the tower count, you see the fish?
 (17) A Right.
 (18) Q And the reason that you use sonar is you use sonar in those
 (19) water bodies where you cannot see the fish?
 (20) A That's right
 (21) Q And the predominant reason in Alaska for not being able to
 (22) see the fish is what?
 (23) A Turbidity of the water
 (24) Q Glacial silt?
 (25) A Right

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- (1) Q So for example in that big mud pond Upper Cook Inlet the
 (2) Kenai the Kaslof the Crescent the Susitna you can't use
 (3) tower counts on those rivers because you can't see down
 through
 (4) the water?
 (5) A Can't see the fish right
 (6) Q And would you basically describe for us if you could
 (7) briefly what the sonar set-up looks like? What does the sonar
 (8) do?
 (9) A Well it looks - you hardly see anything It's all
 (10) underwater What sonar does is - used to call it echo
 (11) sounding Essentially it's sending out pulses of sound in the
 (12) water and as a sound wave goes out into the water if it
 (13) encounters something, call it a target. If it encounters a
 (14) fish it sends back an echo We know the speed of sound is
 (15) nearly constant in water so we get the echo's back, say this
 (16) echo is so far away and that's - in the early days it gave
 (17) you a chart it made marks on the chart from the echoes
 (18) Today these are all done by computer So the echo comes
 (19) back the echo's recorded it takes so many echoes to equal a
 (20) fish It's all done on a computer and here's how many fish are
 (21) out there or how many echoes
 (22) Q Each of the dots on Exhibit Number 379 represents one
 (23) year's worth of data?
 (24) A That's right not a day or an hour it's the year total
 (25) It represents a time period probably three weeks

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- (1) Q So it does it on a year by year basis and it compares what
 (2) the sonar counter says with regard to what fish are in fact
 (3) observed and that s the result that you get?
 (4) A Correct
 (5) Q Now with regard to this regression over to the left here
 (6) you have a formula which is what?
 (7) A That is the equation for that curve that you saw on the
 (8) graph That s all it is So in this equation that s here the
 (9) X over here you would plug in the number of fish from the -
 (10) number of fish estimated from the sonar counter and this is -
 (11) forget what happens here You plug in that number and the Y
 (12) the number you get is the estimate of what the true escapement
 (13) is It s called an exponential It s done by logarithm but
 (14) that s essentially what you do It s the mathematical equation
 (15) to convert or adjust the sonar count from the true number of
 (16) fish in the escapement
 (17) Q And the formula reflects this curve?
 (18) A Exactly If you didn t have that formula and you just had
 (19) this graph and somebody told me well the sonar escapement
 (20) in
 (21) such and such a year was one million I wouldn t need the
 (22) formula I d come up this line at one million this curve and
 (23) come across here and 1 2 million would be the estimate of the
 (24) total escapement That s the easiest way to do it without
 (25) going through the math
 (26) Q I m all for that Now with regard to the Nushagak study

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- (1) and this Nushagak data do you believe that that has any
 (2) application to the Upper Cook Inlet sonar counting system?
 (3) A Yes
 (4) Q Why?
 (5) A Direct application
 (6) Q Why?
 (7) A Because it is the best test it is the only test of the
 (8) sonar as a method of estimating escapement and if I were to
 (9) say well just ignore this and - it would be like a crime
 (10) Q With regard to the Upper Cook Inlet sonar counters are
 (11) there other evidences that support the Nushagak analysis that
 (12) we see in the exhibit?
 (13) A In Upper Cook Inlet?
 (14) Q Yeah
 (15) A Yes there are some other lines of evidence
 (16) Q And would you tell us what those are?
 (17) A For one thing a study was done by the department of Fish &
 (18) Game people in the 1980s where they looked at return per
 (19) spawner ratios in Upper Cook Inlet What this is taking the
 (20) route tables the escapement how many fish spawned how
 (21) much
 (22) fish produced dividing how many fish produced by the
 (23) escapement
 (24) Typically the sockeyes they produce two to three fish for
 (25) every fish in escapement That s typical Two three fish
 (26) return for every fish in escapement When they did the

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- (1) studies they got high ratios in Upper Cook Inlet Seemed
 (2) unreasonable One of the reasons they put was they were
 (3) underestimating the escapement That s one thing that caught
 (4) my eye
 (5) Another thing is that typically for sockeye systems on the
 (6) long run you can take about half the fish 40 50 60 percent
 (7) in long term and have good production Look at Upper Cook
 (8) Inlet and using the escapements that the department has the
 (9) average exploitation rate the percentage they took is 70
 (10) percent This seems to me unreasonable on a long term In
 (11) one
 (12) year two years that s reasonable but not on the long haul
 (13) Then finally the third thing was it had to do with aerial
 (14) surveys You heard about aerial surveys and I talked about
 (15) aerial surveys how that you never see all the fish You re
 (16) lucky to see half of them
 (17) in the Kasilof system in Cook Inlet rather unusual
 (18) situation -
 (19) Q Let me bring up the exhibit on -
 (20) A Oh okay before we look at the Kasilof Here s an
 (21) example
 (22) Q Which one do you want?
 (23) A I want the bottom one only
 (24) Q Which one do you want?
 (25) A This bottom graph
 (26) Q I ll - just a second I m going to have to bring that up

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- (1) again
 (2) A This isn t the - this isn t the Kasilof
 (3) Q You want the Kasilof or -
 (4) A No I want the one you had up there but we don t need
 (5) to - I want to focus on this one
 (6) Q Okay I ll bring it up for you just a second
 (7) A Okay good All right this is from the -
 (8) Q This is from - Doctor this is from Plaintiffs s Exhibit
 (9) 383 which is in evidence just so the court reporter has it
 (10) Go ahead
 (11) A This is a set of data from the Wood River system clear
 (12) water you can see the fish very well there All right and
 (13) there s a tower So we have pretty accurate counts of the
 (14) escapements each year there Each data point here is a year
 (15) On the bottom part we have the known escapement to the lake
 (16) system
 (17) Up here we ve conducted every year aerial and ground
 (18) surveys of the spawning grounds in that system All right so
 (19) each year we plotted what the aerial and ground survey count
 (20) was against the true escapement This green line if the
 (21) survey was seeing the exactly same number as the
 (22) escapement
 (23) you can see here what s happening I don t have any line
 (24) drawn
 (25) here but it s pretty obvious Oops what did I do?
 (26) Q I don t know but you re in big trouble
 (27) A Oh I got to touch the screen with this thing

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- (1) Q There you go
- (2) A All right. You can see here what happens I'll eyeball
- (3) this That's not too bad What happens is is that the
- (4) escapements get larger and larger There's a much greater
- (5) difference from the true - from the aerial survey counts are
- (6) much more underestimating the escapement See what I
- (7) mean?
- (8) Down here if it was 500 000 true escapement you're seeing
- (9) about half of them 250 000
- (10) Look what happens you get to two million - well that's
- (11) off the graph At a million and a half we have here - should
- (12) have opened this up - oh 750 - you're only seeing about half
- (13) of the absolute number The absolute number you're missing is
- (14) very much larger not 250 000 it's whatever - it's 750 000
- (15) Q You want to look at the Kasilof?
- (16) A All right Now this is what one would expect There's
- (17) other sets of data like this that relate aerial survey counts
- (18) and in fact Ken Parker showed some for some individual
- (19) streams
- (20) but these are for a large number of spawning grounds and one
- (21) thing that happened in the survey is the type of large lake
- (22) system is that you don't even see all of the spawners There's
- (23) some that are spawning in places you don't survey or don't see
- (24) and in the example he was showing they were closer because
- (25) he
- (26) was looking at counts in single stream versus the weir count of
- (27) that single stream So here we're looking at lake system big
- (28) surveys

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- (1) Now the same sort of situation in the Kasilof River
- (2) system
- (3) Q Now on the Kasilof the Kasilof is one of the Cook Inlet
- (4) river systems?
- (5) A One of the Cook Inlet river systems
- (6) Q They have a sonar counter?
- (7) A They have sonar so on that graph we can see here right
- (8) here enlarge this one
- (9) Q You want the bottom or the top?
- (10) A The bottom The top graphs we're not talking about here
- (11) are just the ratios and it's not necessary to go into that
- (12) Here's the stream situation Before remember this is the
- (13) survey counts ground and aerial survey and some weir counts
- (14) in
- (15) here too survey counts on each year on the Kasilof system and
- (16) down below here though instead of the escapement, count we
- (17) have sonar escapement. Here's a remarkable thing in two
- (18) years they actually saw more fish in the surveys than the
- (19) sonar counted That's virtually - that is impossible
- (20) in two years they saw as many fish as the sonar saw
- (21) Again I say that's impossible and in these other years it's
- (22) remarkable except for this year out here that they saw such a
- (23) high percentage of the fish That leads me again to believe
- (24) that - that's another small piece of evidence that the sonar
- (25) counters are undercounting the escapement
- (26) Q What is the Susitna tagging study?

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- (1) A All right in the - as I mentioned before in the Susitna
- (2) River they had a sonar just on a tributary part of the river
- (3) system What the department does is they take that sonar count
- (4) and they double it as an estimate of the total Susitna drainage
- (5) escapement In 1984 and 1985 as part of the Susitna hydro project
- (6) when they were talking about putting hydroelectric in there
- (7) big research project biologists tagged fish at the flag horn
- (8) station near the mouth of the Susitna about 50 miles
- (9) upstream They tagged fish and went to the spawning grounds
- (10) and recovered and from that they made a tag marked
- (11) recapture
- (12) of population estimate Estimated the number of fish in the
- (13) escapement from tagging recapturing marked unmarked fish
- (14) This is a common procedure used for salmon in British
- (15) Columbia
- (16) for example
- (17) When they made those estimates they came up with in those
- (18) two years escapement estimates for sockeye that were four
- (19) times greater than the Yentna or sonar station and I believe
- (20) that those - those estimates better reflect the true
- (21) escapement in the Susitna River and therefore I used the - I
- (22) took the Yentna sonar count and multiplied by four rather than
- (23) two to estimate the total escapement in the Susitna River
- (24) Q So you're using the Nushagak curve for the Kenai and the
- (25) Kasilof and the Crescent and you're using the Susitna tagging
- (26) study data for the Susitna?
- (27) A Exactly

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- (1) Q Now we have asked you for Upper Cook Inlet to calculate
- (2) the lost drift catch for 1989 because the drift fishermen did
- (3) not fish in 1989?
- (4) A That's correct
- (5) Q We asked you to do that?
- (6) A Yes
- (7) Q And what did you do to prepare for that?
- (8) A I assembled all the pertinent statistics That was the
- (9) first thing Catches escapements all of the available
- (10) information
- (11) Q How about the ADF&G management reports?
- (12) A Those too That's where most of the information is
- (13) Q And then you did this Nushagak work?
- (14) A No I'd actually done Nushagak work before
- (15) Q And did you have any colleagues work with you on this
- (16) project?
- (17) A Yes I did
- (18) Q Who were they?
- (19) A Mr Jeff June and Dr Greg Ruggerone
- (20) Q Would you tell us from your investigation what happened in
- (21) 1989 with regard to the Upper Cook Inlet drift fleet?
- (22) A The Upper Cook Inlet drift fleet did not fish period
- (23) Q And as a result of that was there any overescapement with
- (24) regard to the Kenai River?
- (25) A Well yes there was

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- (1) Q And I am going to put on the Elmo Plaintiffs Exhibit 363
 (2) and what is Plaintiffs Exhibit 363 which is in evidence?
 (3) A It's pretty simple. It just has two bars. One bar height
 (4) of that bar represents the escapement goal and the little green
 (5) bar is the range goes from 400 000 to 700 000. That's the
 (6) management range 400 000 to 700 000. The department would
 like
 (7) to get numbers of fish and in the Kenai system and in 1989
 (8) the sonar count alone was 1.6 million.
 (9) Q What is Exhibit 387 which is Plaintiffs Exhibit 387 which
 (10) is in evidence?
 (11) A This shows in the first column here ADF&G estimates of the
 (12) escapements in 1989 in Upper Cook Inlet by river and in the
 (13) second column had a revised estimate of the estimates I made
 (14) what I believed were the true escapements in those rivers in
 (15) 1989.
 (16) Q Okay let's take them if we can river by river.
 (17) A All right sir. In the Kenai River I'm just going to
 (18) round these off and talk about millions so I don't have the
 (19) numbers here. In the Kenai River ADF&G was about 1.6 million
 (20) and using that relationship you saw took that 1.6 million on
 (21) the bottom came up to that line and came across and that was
 (22) about 2.7 million if I'm reading this right. Yes.
 (23) Now -
 (24) Q What do you do on the Kaslof?
 (25) A In the Kaslof River the escapement was so small, the

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- (1) sonar count was 158 000. If you went back and looked at that
 (2) relationship that we had that curvilinear relationship when
 (3) you get down to numbers that small it's kind of unreliable and
 (4) actually we predict a much greater increase than this
 (5) 200 000. So I thought that was kind of unreasonable and so
 (6) what we did is we increased this 158 000 by just the average
 (7) percentage undercount. So it's being very conservative. So
 (8) that increased 158 000 to 209 000.
 (9) And the same procedure was followed in Crescent River with
 (10) only 71 000 just increased that by 24 percent made it
 (11) 94 000.
 (12) And then in the Susitna River what we can see here is the
 (13) Fish and Game's sonar. The Yentna sonar was 96 000. They
 (14) doubled it and came up with 200 000. I took the 96 000 and
 (15) multiplied by 4.07 and got 300 000.
 (16) Q Where did you get the 4.07?
 (17) A That came from the two years when they estimated the actual
 (18) total river escapement.
 (19) Q Then you have on the bottom of this -
 (20) A All right in these two small systems Fish Creek and
 (21) Packers Creek they have weirs there so there's no adjustment
 (22) to the count. The weir is an accurate count of escapement.
 (23) One has 67 000. The other one had - Packers Lake 22 000.
 So
 (24) those are the - then at the bottom there of that have these 2
 (25) million and 3.5 million that's the total then for those

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- (1) sockeye systems where there's a count of one type or another
 (2) Now in addition around Cook Inlet in this large area
 (3) there's several small systems maybe a thousand fish 5 000
 (4) fish a few hundred whatever. Fish & Game estimates
 (5) routinely estimates that those additional systems combined
 (6) represent about 15 percent of the total escapement in the
 (7) counted systems. So we have to add on - in this case it was
 (8) 302 000. I used that same figure. I didn't take 15 percent of
 (9) the revised one. I took 15 percent of their figure and added
 (10) that on.
 (11) So then you come down here then although their - their
 (12) recorded escapement was 2.3 million we believe it was 3.8
 (13) million as the true escapement in 1989.
 (14) Q So that's 3.8 million that got upstream?
 (15) A In addition there were five million fish caught by the
 (16) setnet. So the total run was almost nine million. So that's
 (17) the first figure we're after. What was the total number of fish
 (18) entered Cook Inlet in 1989 and there was almost nine million.
 (19) Q What is Exhibit Number 395 which is in evidence
 (20) Plaintiffs 395?
 (21) A All right if you recall I said the total the total run
 (22) was estimated to be about nine million in 1989. Next problem
 (23) was to estimate if there hadn't been an oil spill and it was a
 (24) nine million run what would the fleet have caught of that nine
 (25) million fish?

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- (1) All right we did this - we made two estimates of this
 (2) One we assumed that Fish & Game was perfect and therefore
 we
 (3) took and subtracted from this nine million or almost nine
 (4) million what the escapement goals were. Said all right they
 (5) managed the run correctly if there had been no spill and they
 (6) got the escapement goals and the rest would have been caught
 (7) and that gave us the figure here of about 7.3 million total
 (8) projected salmon harvest.
 (9) Then we took a second method said well maybe they're not
 (10) going to be perfect. What's a good estimate of what the
 (11) fishermen would have caught with the available information and
 (12) that was what percentage the fishermen caught in 1988. In
 1988
 (13) there was no problem in Bristol Bay - in Cook Inlet with oil
 (14) it was a normal fishery and it was a large run. So that was a
 (15) good year to see what - estimate what proportion of the run
 (16) the fishermen would catch.
 (17) So we took that number and I think it was like 70 percent
 (18) whatever it was that proportion that gave us an estimate of
 (19) about 6.7 million. These two numbers actually aren't very far
 (20) apart. Roughly they would have caught about seven million
 (21) fish the total fleet. The actual catch was five million so
 (22) the loss here was about two million.
 (23) Most importantly we tried to estimate what the drift fleet
 (24) would have caught had there been a normal fishery. To do this
 (25) we took the seven million fish took the two estimates here

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- (1) coming down to the bottom right here the drift fleet on the
 (2) average takes 60 percent of the - 60 percent of the catch in
 (3) Cook Inlet so applied the 60 percent to those two numbers and
 (4) that gave us the number we're after. The total projected drift
 (5) gillnet harvest would have been 4 to 4.4 million in 1989 had
 (6) there not been disruption in the fishery
 (7) Q I wanted to discuss a couple aspects of this one of which
 (8) is admittedly a complicating factor and I'll get to that in a
 (9) minute but historically the drift fleet catches 60 percent of
 (10) the run and the Cook Inlet setnetters catch about 40 percent of
 (11) the run?
 (12) A That's correct
 (13) Q And in 1989 the setnet fleet did in fact fish?
 (14) A Right
 (15) Q And they had a very good year?
 (16) A Bonanza
 (17) Q Because there were no drifters out there to intercept the
 (18) fish before they got to the setnetters?
 (19) A Exactly
 (20) Q But the fact that the setnetters had a good year doesn't
 (21) mean that the drifters were any less hurt does it?
 (22) A No it's immaterial to the driftnetters. They got zero
 (23) Q The driftnetter gets zero so it makes no difference to him
 (24) whether that fish goes to a setnetter or up the stream?
 (25) A None

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- (1) Q At this four million dollar drift gillnet harvest number -
 (2) A Four million fish
 (3) Q Four million fish and the average weight of a fish we'll
 (4) get to that in a minute but this four million fish number is
 (5) your view of what the number of fish the drift gillnetters
 (6) would have caught but for the oil spill?
 (7) A Exactly
 (8) Q Now let's translate that using Exhibit 370 which is in
 (9) evidence Plaintiffs Exhibit 370 which is dark get it -
 (10) that's hard to see I think that's the best we're going to
 (11) do. Let me - maybe I'll try it on the - let me try it on the
 (12) Elmo I think that's much better. Is that better?
 (13) THE COURT Yeah that's much better
 (14) MR O NEILL Actually had a back-up system that
 (15) worked
 (16) BY MR O NEILL
 (17) Q Using the Exhibit Number 370 tell us what you do on
 (18) Exhibit 370?
 (19) A I lost my little -
 (20) Q Won't work on this
 (21) A Okay
 (22) Q In fact because it won't work on it maybe with the
 (23) Court's permission if he could come down and point on it. The
 (24) little wand will not work so why don't you just -
 (25) A If everyone can see this I can describe this

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- (1) Q Go
 (2) A We just - on the last table we saw the bottom line there
 (3) were those two numbers 4 and 4.4 million. That's the second
 (4) pair of numbers on this under sockeye here. The foregone
 (5) harvest isn't important here. All right so we have the two
 (6) estimates that the drift fishermen didn't catch 4 million fish
 (7) they would have caught. We want to come up with a dollar
 (8) amount so it's very straightforward. All we need is the
 (9) average weight of a fish because fishermen aren't paid by the
 (10) fish they're paid by the pound. That's why we got to get pound
 (11) damage then we got to get what they're paid per pound
 (12) So Alaska Fish & Game reports their average weight of
 (13) sockeye in Cook Inlet in 1989 was 6.6 pounds. We multiply 6.6
 (14) by the two estimates gives us - two estimates gives us the
 (15) harvest in pounds damage about 26.5 million pounds and 28.8
 (16) million pounds and the price per pound. Fish and Game reports
 (17) Cook Inlet 1989 was a dollar seventy at that point. We
 (18) multiply the dollar seventy by pounds we come up 45 million
 (19) dollars for one estimate and 49 million for the other. So
 (20) somewhere 45 to 49 million
 (21) Q What are the differences between the two estimates again?
 (22) You went through this before but just to bring it into context?
 (23) A One assumed Fish & Game had perfect management that
 (24) year
 (25) and the fleet caught everything except escapement goals
 Other
 (25) thing says 1989 would have been the same just like it was in

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- (1) 88 and the fleet would catch the same proportion of the run
 (2) That's my personal favorite
 (3) Q And what are the columns with regard to chinook coho pink
 (4) and chum?
 (5) A We don't have escapement any escapement counts for the
 (6) other species and you can see the numbers here are minor
 (7) compared to the sockeye in numbers and in value. And so for
 (8) those for those others we used the historical averages to
 (9) estimate what the catch would have been in 1989
 (10) Q And the total losses are \$54,006,774?
 (11) A That's correct.
 (12) Q And is that your best work with regard to what the Upper
 (13) Cook Inlet salmon foregone harvest value would have been but
 (14) for the Exxon Valdez oil spill?
 (15) A That's correct.
 (16) Q I want to move to Kodiak I don't want to move to Kodiak
 (17) I want to move to the subject of Kodiak I may want to move to
 (18) Kodiak
 (19) How did you estimate the 1989 Kodiak foregone harvest but
 (20) for the Exxon Valdez oil spill? Well first of all what did
 (21) you do to get ready to do this?
 (22) A Just as in the case of Cook Inlet assembled all of the
 (23) relevant statistics on past runs catches escapements and
 (24) including 1989
 (25) Q And were there fishery closures in Kodiak?

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- (1) A Yes
 (2) Q And what fisheries were closed in Kodiak?
 (3) A Well the only fisheries that occurred in Kodiak that s
 (4) easier was a very limited fishery They caught a lot of fish
 (5) but very limited fishery just off the Kitoi Bay hatchery Some
 (6) fishermen were selected to fish there Wasn t open to
 (7) everybody And a setnet fishery in Alitak Bay The remainder
 (8) of the island was closed
 (9) Q What is Plaintiffs Exhibit 385 which will be on the screen
 (10) in just a second? Let me use the Elmo again Would you
 (11) explain Exhibit 385 to the jury?
 (12) A Yes this is just like the table we just saw for Cook
 (13) Inlet The difference here is that we didn t generate these
 (14) numbers for Kodiak The Alaska Department of Fish & Game
 (15) did a
 (16) report and they estimated this top these numbers at the top
 (17) So we used their numbers There was no need for us to go
 (18) through and do this all - we looked at the report could find
 (19) no serious disagreement with it and so we used their numbers
 (20) They did no report like this in Cook Inlet so we had to
 (21) make our own estimates there
 (22) Q And the Kodiak salmon foregone value as a result of your
 (23) analysis and using the ADF&G numbers comes to \$50 638 499?
 (24) A That s correct You see most of it is in pink salmon and
 (25) sockeye
 (26) Q And as a result of your work is this your best work as to

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- (1) what the Kodiak salmon foregone value would have been?
 (2) A It is
 (3) Q With regard to both the Kodiak salmon foregone value and -
 (4) with regard to both the Kodiak salmon foregone value and the
 (5) Upper Cook Inlet salmon foregone value that we ve looked at
 (6) today is it your opinion that those are what the commercial
 (7) harvest would have been to those fishermen but for the Exxon
 (8) Valdez oil spill?
 (9) A Yes it S
 (10) MR O NEILL And I have no further questions
 (11) THE COURT You may cross-examine
 (12) MR NEAL Yes Your Honor just give me a moment here
 (13) to collect a couple of things
 (14) CROSS EXAMINATION OF DR DONALD ROGERS
 (15) BY MR NEAL
 (16) Q Mr Rogers I had - it s Dr Rogers I believe?
 (17) A Yes
 (18) Q Dr Rogers I had the pleasure of meeting you just a few
 (19) moments ago outside You ve been accepted as an expert and
 (20) I m
 (21) not so bear with me
 (22) I want to explore some differences of opinion here and I
 (23) gather you ll agree that even qualified experts do disagree
 (24) sometimes?
 (25) A Certainly
 (26) Q Or a lot of the time maybe?

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- (1) A Most of the time
 (2) Q Just like lawyers The - you disagree with the Alaska
 (3) Department of Fish & Game with respect to the run size in the
 (4) Upper Cook Inlet in 1989?
 (5) A That s correct
 (6) Q Could I - and a lot of this is just educating me so will
 (7) you bear with me a minute? I m going to put something up here
 (8) and see if I can get to the heart of the disagreement I ve
 (9) already written something on this board here that -
 (10) MR SANDERS You didn t write that
 (11) MR NEAL I didn t write it I had it written you re
 (12) right They re going to see the difference in just a moment,
 (13) Jimmy
 (14) BY MR NEAL
 (15) Q What we re talking about here is run size on the rivers of
 (16) Upper Cook Inlet, correct from 1989?
 (17) MR O NEILL I object to the handwriting
 (18) THE COURT Looks reasonably good compared to mine
 (19) BY MR NEAL
 (20) Q That s what we re talking about isn t it Doctor?
 (21) A I guess
 (22) Q And your calculations are that - well let me back up and
 (23) say to satisfy myself here when we re simply speaking and
 (24) get it simple enough for me run size - by the way these are
 (25) in - these are in the thousands over here but just for

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- (1) lack - just to save space that s 3 768 000
 (2) A I know
 (3) Q I know but I - and that s 5 011 000 rounding off with a
 (4) few fish thrown aside there In order to get - simply to get
 (5) a run size for a year which is what we re talking about and
 (6) what you ultimately get to with your dollar figures you really
 (7) have to estimate based on the tools that Mr O Neill talked
 (8) about estimate the escapement and add to it the catch and you
 (9) come up with what I ve called run size is that a fairly simple
 (10) way to do it but fairly accurate?
 (11) A Yes
 (12) Q Okay You say that the escapement up in the Upper Cook
 (13) Inlet was 3 768 000 and the Alaska Department of Fish & Game
 (14) came up with 2 317 000 correct?
 (15) A Yes
 (16) Q Or about - you differ by about a million and a half fish?
 (17) A Yes
 (18) Q Now you were here when Mr Parker testified that based on
 (19) his studies the ADF&G was in the process or had changed their
 (20) count in Prince William Sound for 1989? Did you hear that?
 (21) A I probably heard it but it - I mean are you asking me
 (22) now about Prince William Sound? Because I don t -
 (23) Q Did you hear Mr Parker say that?
 (24) A I heard Mr Parker testifying but don t ask me what - what
 (25) he said

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- (1) Q In any event - in any event the ADF&G notwithstanding
 (2) your difference of opinion has not changed its count for 1989?
 (3) A In recent years is that what you're getting at?
 (4) Q Pardon me?
 (5) A You're getting - in recent years they haven't changed the
 (6) count
 (7) Q They haven't gone back and said oh no -
 (8) A That's right.
 (9) Q - Dr Rogers is correct I'm going to go back and change
 (10) this?
 (11) A No they haven't
 (12) Q They still stick with this that this is their opinion?
 (13) A As far as I know
 (14) Q A major way you get this I hate to use this word I
 (15) recently learned it but a major way you get this is based on
 (16) your study of what you say is the difference between the sonar
 (17) count of sockeye salmon count on the Nushagak River as
 (18) contrasted with the tower count on that river?
 (19) A Correct
 (20) Q Using this word you transpose or extrapolate from that
 (21) because it is your opinion that you can use that difference in
 (22) count or your formula of difference in count and say okay
 (23) based on the difference in count between the sonar and tower
 (24) on
 (24) the Nushagak River I'm going to apply that and say that would
 (25) apply and that kind of - that kind of difference would be

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- (1) applicable to the Upper Cook Inlet rivers correct?
 (2) A Correct
 (3) Q All right Now without getting - without taking all the
 (4) time to go through all of the different species chum all of
 (5) that, and go through the different rivers, I think maybe I can
 (6) explore the differences of opinion here between you and
 ADF&G
 (7) by simply taking the Kenai River?
 (8) A Okay
 (9) Q Because most of that - matter of fact, as I read your
 (10) report or deposition of that 1 451 000 difference between -
 (11) in run size between you and the Department of Fish & Game
 (12) approximately 1 1 million of that was your difference of
 (13) opinion as to the Kenai?
 (14) A Correct.
 (15) Q Now, let me take up some - so I don't have to bother this
 (16) again - I've read - may I approach Your Honor with the
 (17) deposition? That's your depositions in case you have to
 (18) refer I know, but you probably won't have to fool with that
 (19) very much
 (20) I've read your deposition Dr Rogers and talking about
 (21) your differences of opinion now okay this - what you're
 (22) doing here and what ADF&G was doing here you're using
 (23) different ideas was really estimating Nobody knows the exact
 (24) run size for 1989 do they?
 (25) A Exact to what kind of exact? Ballpark we know it I

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- (1) would say the run was about nine million and they estimated
 (2) about seven so it's somewhere in that neighborhood of seven
 to
 (3) nine or maybe -
 (4) Q But nobody has an exact number of this?
 (5) A No nobody knows the exact number of fish anywhere
 (6) Q All of you are estimating?
 (7) A That's right
 (8) Q Is that a fair statement?
 (9) A (Nods head up and down)
 (10) Q And you've already told me that reasonable people can have
 (11) difference of opinion even experts?
 (12) A That's correct
 (13) Q Have you ever done any work with the ADF&G in what's
 (14) referred to and you referred to as the Upper Cook Inlet
 (15) management area?
 (16) A Have I worked with them in management in the area? No
 (17) Q Okay is it a fair statement Dr Rogers that the ADF&G
 (18) people who work in the Upper Cook Inlet know more about
 sockeye
 (19) salmon than you do?
 (20) A What was that? They know more about sockeye salmon than
 I
 (21) do?
 (22) Q Yes
 (23) A No
 (24) Q They don't?
 (25) A No no way Now if you mean do they know more about the

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- (1) sockeye salmon stocks in Upper Cook Inlet?
 (2) Q That's what I meant
 (3) A You didn't say that You said know more about sockeye
 (4) salmon
 (5) Q Doctor I can see now why they gave me you to
 (6) cross-examine Okay? If I misstate it I don't think I'll
 (7) have to tell you this I know you'll tell me Okay?
 (8) What my question I think should have been do they know
 (9) more about the sockeye salmon in the Upper Cook Inlet
 (10) management area than you do?
 (11) A There's probably a couple of individuals that do yes
 (12) Q Now your work principally had been done on the Nushagak
 -
 (13) Nushagak River?
 (14) A No Bristol Bay
 (15) Q Bristol Bay?
 (16) A Whole Bristol Bay yeah
 (17) Q There are in these different rivers now - as I say you're
 (18) taking your study from the Nushagak -
 (19) A Could I correct something here? I did an analysis of the
 (20) Nushagak data that was collected by the Alaska Department of
 (21) Fish & Game They choose to ignore this and call this their
 (22) sonar escapements true escapement in the Nushagak All
 (23) right? But I analyzed their data I didn't go out and make
 (24) the tower counts on Nushagak River
 (25) Q They haven't tried to extrapolate that from the Nushagak to

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- (1) the Kenai have they?
- (2) A No They haven't used it anywhere They just ignore it
- (3) Q Have you ever - there are sites by the way on these
- (4) various rivers the Nushagak - I'm always afraid I'm going to
- (5) continue to mispronounce that the Nushagak River and the Kenai
- (6) River correct counting sites for sonar?
- (7) A Oh for sonar
- (8) Q And in the Nushagak there will be counting sites for sonar
- (9) and for the tower?
- (10) A They don't have a tower on the Kenai
- (11) Q For Nushagak?
- (12) A Right
- (13) Q Have you ever been to the counting sites for the sonar on
- (14) the Kenai River?
- (15) A Only looked at it from the air
- (16) Q Only from the air?
- (17) A Right
- (18) Q Those are - the rivers are different aren't they Dr
- (19) Rogers?
- (20) A They're different in size yes
- (21) Q Do you know the width of the Nushagak River?
- (22) A It's like three feet - I think it's about 900 feet
- (23) something like that It's pretty wide
- (24) Q Do you know the depth of that river?
- (25) A Approximately where the sonar is I think it's around 10

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- (1) feet
- (2) Q What about the current or velocity of the Nushagak River?
- (3) A You got me there
- (4) Q Okay Do you know anything about the comparison of the
- (5) velocity of the waters of the Nushagak as compared to the Kenai
- (6) at the sonar sites?
- (7) A No I haven't made a study of that
- (8) Q Could this comparative velocity of the water and the width
- (9) of the rivers the various rivers the two rivers we're talking
- (10) about could that affect fish behavior in these two locations?
- (11) A Yes it could
- (12) Q Do you have any knowledge how that fish behavior would be
- (13) affected?
- (14) A I don't know what the behavior is
- (15) Q All right But it could be affected by things I've just
- (16) mentioned?
- (17) A Yes
- (18) Q Have you ever investigated that when you're extrapolating
- (19) these figures from the Nushagak to the Kenai River?
- (20) A No
- (21) Q Do you have an opinion Dr Rogers whether the Kenai River
- (22) site is more suitable for counting sockeye than the Nushagak
- (23) River site at Portage Creek?
- (24) A That it's more suitable
- (25) Q More suitable Do you have an opinion as to one is more

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- (1) suitable than the other?
- (2) A I would say they are similar because sockeye migrate along
- (3) the banks so it's irrelevant how wide the river is
- (4) Q Let's talk about that for a minute
- (5) A Okay
- (6) Q The sockeye salmon basically are bank-oriented fish?
- (7) A Sockeye and pink salmon yes
- (8) Q I'm going to limit myself to sockeye for a minute So
- (9) they'll go up the banks but quite clearly if the river's
- (10) wide some of them will go up the middle or away from the
- (11) banks will they not?
- (12) A It would be unusual
- (13) Q Unusual?
- (14) A Uh-huh
- (15) Q Would that have anything to do with the water velocity or
- (16) the current of the river?
- (17) A Yes That's why they migrate along the bank because that's
- (18) the place of least resistance when they're moving against the
- (19) current
- (20) Q Let's see if you had a wide river with less water
- (21) velocity you might get more salmon sockeye salmon going up
- (22) away from the bank than you would if you had a narrower
- (23) swifter
- (24) river isn't that true?
- (25) A It's true that you might I wouldn't expect it but you might

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- (1) MR NEAL Let's look at these two rivers that you're
- (2) using in your testimony here today And I offer in evidence
- (3) Defense Exhibit 5665
- (4) MR O NEILL No objection
- (5) THE COURT Defendants exhibit 56 - is it 65?
- (6) MR NEAL 5665 Your Honor
- (7) THE COURT Defendants 5665 is admitted
- (8) MR NEAL Sorry Your Honor that's Defendants
- (9) Exhibit 5665-Able
- (10) (Exhibit 5665-A offered)
- (11) THE COURT Any problem with the A version?
- (12) MR O NEILL No sir or the B version
- (13) THE COURT We're going to admit 5665-A
- (14) (Exhibit 5665-A received)
- (15) BY MR NEAL
- (16) Q Do you recognize that Dr Rogers as being the comparative
- (17) width and depths of those two rivers the top one being the
- (18) Nushagak and the bottom one being the Kenai?
- (19) A I see this this is the first time I've seen this but I
- (20) have no idea I'll accept these are correct figures
- (21) Q Now I want to run this on out up here if I may You've
- (22) got your numbers here going down to the dollars I think in
- (23) this manner Check me if I'm right This is the run size
- (24) correct?
- (25) A That's correct

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- (1) Q All right and you said - moving on down you said there
 (2) is something called the exploitation rate?
 (3) A The proportion that was caught
 (4) Q You say it's your opinion that in - this would be the run
 (5) size based on your extrapolation from the Nushagak to the -
 (6) to the Upper Cook Inlet rivers right? This would be the run
 (7) size?
 (8) A Yes but that's only part of it I won't say the whole
 (9) thing is based on the extrapolation You're not talking about
 (10) Kenai you're talking about the whole Upper Cook Inlet
 (11) Q I'm basically dealing with Kenai but the other two or
 (12) three rivers too but to move beyond that, you said the
 (13) fishermen had they been allowed to fish all of them both the
 (14) driftnet and the setnetters they would have captured 76.3
 (15) percent of that run size?
 (16) A If - I don't remember the number that exactly but it was
 (17) 70-something percent right
 (18) Q That leaves you then I think you'll recognize this
 (19) (indicating), am I correct?
 (20) A Yes sir
 (21) Q Now of course if the ADF&G's figure up here is right your
 (22) dollar figure is substantially off?
 (23) A Of course
 (24) Q And if this exploitation rate which is a - which is based
 (25) on what?

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- (1) A That was the exploitation rate in 1988 which is the year
 (2) most similar in characteristics to the 1989 run
 (3) Q Okay but if that - if that - and I'll just put it out
 (4) here If that were 70 percent that would affect - that would
 (5) reduce the dollars would it not?
 (6) A Of course and if it were 90 percent it would increase it
 (7) Q Increase it I understand I'm not arguing with you Dr
 (8) Rogers but you did testify this morning that the average
 (9) exploitation range that is the percentage of the - percentage
 (10) of the run size that the fishermen would catch the average was
 (11) 70 percent do you remember that?
 (12) A Yes
 (13) Q Over a period of years?
 (14) A Yes
 (15) Q So back again then - and don't get mad at me now
 (16) Doctor I'm not arguing with you I'm just trying to say that
 (17) there may be - people can differ That's the reason I started
 (18) this Not that you're doing anything but telling your honest
 (19) opinion I've read your deposition Your deposition says kind
 (20) of this is my opinion take it or leave it. So I'm just going
 (21) to say that there's some other areas
 (22) If this is 70 percent exploitation rate then your dollar
 (23) amount would be lower correct?
 (24) A Correct
 (25) Q All right Now then to go on from that you say that of

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- (1) this amount number of fish caught had they been allowed to
 (2) fish the driftnetters would have caught 60 percent of that
 (3) correct?
 (4) A Correct
 (5) Q And that gets you to your figure - actually it gets you
 (6) to your preferred figure according to your deposition of this
 (7) (indicating) rather than the alternative larger number you
 (8) said isn't that correct Dr Rogers?
 (9) A That's correct
 (10) Q All right And then you take a pound at 66 Now by the
 (11) way while I'm on that 40 percent of this figure is a whole
 (12) lot less than what the setnetters got in 89 wasn't it?
 (13) A Yes it was
 (14) Q They got a windfall?
 (15) A That's correct
 (16) Q They got - matter of fact this was all setnetters right
 (17) here?
 (18) A That's correct
 (19) Q Had that been 40 percent it would be something like 25 -
 (20) half of that wouldn't it?
 (21) A Yes
 (22) Q And you take the pounds per fish then and you come up
 (23) with 26 525 000 pounds
 (24) A Yes
 (25) Q And then you took a dollar and seventy cents a pound and

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- (1) you come up with 45 093 180 for the sockeye Now there's
 some
 (2) others that you've got in the exhibit in evidence but for
 (3) comparison purposes that's what you come up with as the - as
 (4) the loss if we give you - if you assume all these figures
 (5) correct that's what you come up with as a loss of the
 (6) driftnetters for 1989?
 (7) A Correct
 (8) Q Now then over here if you take on the other hand if you
 (9) take the same things you come up and do it the same way of
 (10) 76.3 and I'll run through this quickly the ADF&G says -
 (11) A ADF&G never did this You're doing it for the first time
 (12) incidentally
 (13) Q I'm doing it for the first time I could have stopped
 (14) right here as far as the ADF&G's concerned couldn't I?
 (15) A That's right
 (16) Q But in order to see where the differences are I'm going to
 (17) say that I'm taking your figures for the rest of the way out
 (18) just to show the difference
 (19) A Okay
 (20) Q And then 66 comes up if I've done this right or
 (21) somebody's done it right for me Mr Sanders -
 (22) MR SANDERS It's not the first time you've done it
 (23) either
 (24) MR NEAL You know you take a kid out of the
 (25) country

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- (1) BY MR NEAL
 (2) Q And we come up then with 37 640 383 These are amounts
 (3) that I can assure you that boggle my mind but that's where
 (4) they are That's a fair - that's a fair difference between
 (5) you and the ADF&G if you accept these figures that you've put
 (6) in rather than what they put in correct?
 (7) A It's the difference between my calculation and yours
 (8) Q Well this is not my calculation up here up here
 (9) A No that's just the run size right
 (10) Q Down here I am merely using what you used over there fair
 (11) enough?
 (12) A Okay
 (13) Q And that -
 (14) A That's using what I used with ADF&G's run size
 (15) Q Pardon me?
 (16) A That's what you've done You've taken the percentages and
 (17) the poundages and the dollars that I used and you started with
 (18) ADF&G size right.
 (19) Q I believe you and I both want to say it our own way
 (20) because that's exactly what I thought I said I take the ADF&G
 (21) run size and I applied your figures over here fair enough?
 (22) A Fair
 (23) Q I want to go back a minute - I'll take this down for the
 (24) moment This Defendants Exhibit 9307 which I offer in
 (25) evidence it's kind of a mobile - it's your Exhibit Number

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- (1) 379 I'll put that on here As I understood it in order to
 (2) come up with your opinion as to the run size or overescapement
 (3) on the Kenai and the other rivers you looked at the Nushagak
 (4) where it has a - both a sonar method of counting fish and a
 (5) tower method of counting fish correct?
 (6) A That's correct
 (7) Q And by the way you may have said this this morning but
 (8) you can't on the Kenai River you can't have both can you?
 (9) A No
 (10) Q And you said in substance okay if there's this - if
 (11) there is an overescapement - if the tower count on the
 (12) Nushagak is higher than the sonar count on the Nushagak I
 (13) believe it would be the same way on the Kenai that's your
 (14) position correct?
 (15) A Correct
 (16) Q All right and I believe you also said that the difference
 (17) would be greater between tower and sonar as the run size got
 (18) larger?
 (19) A As the escapement got larger
 (20) Q As the escapement got larger right which is part of the
 (21) run size?
 (22) A That's correct
 (23) Q And you came up then with your Exhibit Number 379 your
 (24) curvilinear graph?
 (25) A Yes

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- (1) Q Now to do that you took the counts in certain years
 (2) correct?
 (3) A All the available data
 (4) Q All the available data to prepare your chart Now I
 (5) believe you've testified that this is - by the way you
 (6) counted both sockeye and pink -
 (7) A No I didn't count The Department of Fish & Game counted
 (8) both sockeye and pinks
 (9) Q The Department of Fish & Game counted both sockeye and
 (10) pink correct?
 (11) A That's correct
 (12) Q Now this is a sockeye count in 1980 you familiar with
 (13) that?
 (14) A Yes
 (15) Q And you've agreed in your deposition I believe that that
 (16) was an aberration, that you were suspicious of that count?
 (17) A I don't think I said in my deposition I was suspicious of
 (18) the count I said they started in 1979 and I said it was - it
 (19) was reasonable that if you - to throw out 79 and 80 and
 (20) that's the 1980 count because it does seem to be higher than
 (21) the other points
 (22) Q I believe you used the word I'm suspicious of that?
 (23) A I could have
 (24) Q You're right but you said they did only start in 1979 and
 (25) I'm suspicious of both 79 and 80?

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- (1) A Okay
 (2) Q If you - if you bear with me a minute because I want to
 (3) make a point I'm going to take that off then I'm suspicious
 (4) of it too
 (5) Now have you made a - this is a pink right? This is a
 (6) pink count?
 (7) A You've made it pink so I guess it is
 (8) Q Well no I've done that because I understand that -
 (9) A I don't remember what each of those dots are But I would
 (10) say it's probably a pink salmon count that's right
 (11) Q It is a pink salmon count as a matter of fact, in the same
 (12) year as the sockeye I just removed 1980 Did you make a
 (13) mistake? Should that be over here somewhere?
 (14) A No I don't think so
 (15) Q But it is pink not sockeye correct?
 (16) A Yeah
 (17) Q I'm going to take that off
 (18) A Okay
 (19) Q I'm going to see if I can make a point Dr Rogers whether
 (20) you agree with it or not
 (21) A Oh all right
 (22) Q And this is a pink correct?
 (23) A That's correct
 (24) Q Because we're dealing with sockeye on the upper - the
 (25) major problem I said here the difference was sockeye?

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- (1) A I see what you re getting at yeah
 (2) Q All right so I m going to remove that pink Now this is
 (3) a pink also isn t it?
 (4) A Yes
 (5) Q And I m going to remove that Now when you remove that
 (6) what you have is a good grouping along here of a linear
 (7) progression right?
 (8) A All statisticians would roll over in their grave for what
 (9) you ve just done to state a point
 (10) Q I m not responsible for any statisticians
 (11) A But that s correct right if you remove all that you get
 (12) an entirely different picture
 (13) Q And if you do this and you leave only the - only the
 (14) sockeye salmon which I came up here and told you I was going
 (15) to talk about right?
 (16) A Right
 (17) Q If you remove all those - by the way are you a
 (18) statistician?
 (19) A I know enough to use statistics
 (20) Q I thought you had some particular empathy for the
 (21) sockeye - for the statisticians If you remove all those
 (22) however what you really have and leave only the sockeye
 (23) count
 (24) on your exhibit what you have here is a close correlation
 (25) between the sonar count and the tower count correct?
 (26) A Well you had a close correlation before before you

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- (1) removed all those points In fact I don t think it s any
 (2) closer now As far as the correlation goes that s just how
 (3) close the points are to the line
 (4) Q Well they do follow that - the linear progression rather
 (5) than your curvilinear don t they?
 (6) A Exactly Now it would be a linear relationship, that s
 (7) right
 (8) Q Now one other - one other thing I m going to ask you
 (9) about a and that is your estimate you made of the Kodiak
 (10) salmon Actually I don t think you made that You used -
 (11) you used ADF&G figures correct?
 (12) A Correct
 (13) THE COURT Mr Neal time out time out. You re
 (14) going to another subject and let s sort of stay on schedule
 (15) MR NEAL Yes sir and that s fine That s great
 (16) THE COURT We ll take our second break
 (17) MR NEAL. I ain t going to stay on the subject very
 (18) long Your Honor
 (19) THE COURT We ll take our second break for 15
 (20) minutes
 (21) (Jury out at 12 03 p m)
 (22) (Recess from 12 03 p m to 12 18 p m)
 (23) (Jury in at 12 18 p m)
 (24) THE COURT Mr Neal?
 (25) MR NEAL. May I proceed Your Honor?

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- (1) THE COURT You may
 (2) MR NEAL I want to offer at this time my handiwork
 (3) over here The number I ve given it and we ll put a sticker
 (4) on it is Deference Exhibit 5801 Alpha
 (5) THE COURT 5801 -
 (6) MR NEAL Able
 (7) THE COURT Why is the A there?
 (8) MR NEAL Why is the A there?
 (9) THE COURT Uh huh
 (10) MR NEAL. Because that s what somebody told me was
 (11) the next defendants exhibit number
 (12) THE COURT Don t ask silly questions I guess
 (13) (Exhibit 5810-A offered)
 (14) THE COURT Is there objection to Exhibit 5801 A
 (15) MR O NEILL. None
 (16) THE COURT All right 5801 is admitted
 (17) (Exhibit 5801 A received)
 (18) MR NEAL. And I think I offered 5665-Alpha and it has
 (19) been admitted
 (20) THE COURT It has
 (21) BY MR NEAL
 (22) Q I have one question Dr Rogers In your Kodiak - in the
 (23) chart that you presented with respect to the Kodiak lost
 (24) harvest for 89 - you with me?
 (25) A Yes

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- (1) Q I don t know unless you say something Doctor
 (2) A Oh okay
 (3) Q I think that assumes a perfect management?
 (4) A That s right
 (5) Q If the management was not in fact perfect that number
 (6) for loss would be less would it not?
 (7) A Yes
 (8) MR NEAL. Doctor, was a pleasure Thank you sir
 (9) THE COURT Before you sit down sir was your
 (10) Defendants Exhibit 9307 -
 (11) MR NEAL. That was really a take-off from their -
 (12) from their exhibit and I m not offering it.
 (13) THE COURT Okay thank you
 (14) REDIRECT EXAMINATION OF DR DONALD ROGERS
 (15) BY MR O NEILL.
 (16) Q I want to talk about this version Defendants Exhibit 9307
 (17) for identification for a moment. Now with regard to this
 (18) relationship you tested this relationship for Upper Cook Inlet
 (19) against other data, didn t you? Exploration rates -
 (20) A Oh okay I see what you mean now Yes I mean it
 (21) wasn t - the situation up at Cook Inlet with regard to
 (22) undercounting the escapement didn t just depend on this
 (23) relationship As I said, if this was the only thing we had I
 (24) wouldn t be so certain that we have a problem of
 (25) underescapement but there were these other things I talked

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- (1) about high exploitation rate high return of spawners
- (2) unreasonable aerial survey estimates if sonar was correct -
- (3) there were other things besides this
- (4) Q And the sum and substance of those leads you to what
- (5) conclusion?
- (6) A That the escapements for total of Upper Cook Inlet are
- (7) underestimated
- (8) Q This provides a fair guideline for estimating?
- (9) A Right
- (10) Q And the point was made about the pinks?
- (11) A Yes
- (12) Q And you said that a statistician would roll over in his
- (13) grave Why do you think it is fair to use the data points that
- (14) were used?
- (15) A Because the pink salmon actually are almost better data
- (16) points than the sockeye I don't want to go into it but pink
- (17) salmon migrate up the river after the sockeye and when they
- (18) migrate up the river that is practically the only species in
- (19) the river They migrate up the banks just as the sockeye do
- (20) They tend to be large numbers That was convenient We
- (21) needed
- (22) some observations of large numbers
- (23) Q With regard to the observations you didn't throw out any
- (24) data at all did you?
- (25) A No
- (26) Q Now with regard to the Nushagak and the Kenai and the

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- (1) attempted - the comparison between the Nushagak and the
- (2) Kenai
- (3) you used the phrase that the salmon were bank seeking?
- (4) A Bank-oriented They migrate along the bank because that is
- (5) the lowest velocity of water and they're going upstream
- (6) Q What relevance does that have to comparing the Nushagak
- (7) and
- (8) the Kenai with regard to sonar counters?
- (9) A If they migrate up the bank it doesn't make any difference
- (10) how wide the river is
- (11) Q With regard to the bank orientation of the salmon that is
- (12) a very well established fact with regard to fish?
- (13) A Pinks and sockeye right
- (14) MR O NEILL I have nothing further Thank you
- (15) Doctor
- (16) THE COURT Thank you Doctor
- (17) THE WITNESS Thank you good to see you
- (18) THE COURT Yes indeed Call your next witness
- (19) MR SARKO Your Honor Dr Gregory Ruggerone
- (20) THE CLERK Would you raise your right hand please
- (21) sir?
- (22) (The Witness is Sworn)
- (23) THE CLERK Please be seated For the record sir
- (24) state your full name your address and spell your last name
- (25) please
- (26) THE WITNESS My name is Gregory Ruggerone last name
- (27) is spelled R u g g e r o n e My address is 6148 Northeast

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- (1) 194th Place Seattle Washington
- (2) MR SARKO Your Honor and the jury we haven't met
- (3) Your Honor but I am Lynn Sarko one of the Plaintiffs
- (4) counsel
- (5) DIRECT EXAMINATION OF DR GREGORY RUGGERONE
- (6) BY MR SARKO
- (7) Q Doctor can we start and tell me what you do right now?
- (8) A I'm a fisheries scientist with Natural Resources
- (9) Consultants
- (10) Q That is in Seattle?
- (11) A Yes
- (12) Q Are you married?
- (13) A Yes I am
- (14) Q Do you have children?
- (15) A Yes one daughter
- (16) Q I'd like to go into your background and I might - the jury
- (17) will find out you do know Dr Rogers correct?
- (18) A Yes
- (19) Q And let me start with telling us where you got your
- (20) bachelors degree?
- (21) A Bachelor of science degree in biology was at the University
- (22) of California Irvine 1978
- (23) Q Did you later get a masters?
- (24) A Yes I did I received a masters of science in fisheries
- (25) at the University of Washington in 1981

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- (1) Q And what was your masters thesis in?
- (2) A My research project involved arctic char predation on
- (3) sockeye salmon smolts in a Bristol Bay rivers
- (4) Q Did you later earn a Ph D ?
- (5) A Yes I did I also received a Ph D in 1989 at the
- (6) University of Washington
- (7) Q What was your doctoral studies on?
- (8) A My doctoral research was coho salmon predation on juvenile
- (9) sockeye salmon in the Chignik lakes
- (10) Q In Chignik lakes?
- (11) A Yes
- (12) Q Let me ask you a question since you received your doctor's
- (13) degree where do you spend most of your time during the year?
- (14) You spend some of your time in Alaska?
- (15) A Yes I do I spend considerable time in Alaska The past
- (16) several years approximately three months each year in Alaska
- (17) and about nine months in Seattle analyzing data
- (18) Q And when you spend your time in Alaska how do you spend
- (19) it?
- (20) A Primarily most of my time is spent in the Chignik Lake's
- (21) drainage but I've spent other time in the Bristol Bay
- (22) drainage
- (23) Q You spend time there doing research?
- (24) A Yes
- (25) Q What type of research?

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- (1) A Variety of research In general our program is to determine survival of salmon and to develop techniques to improve salmon management or to improve habitat conditions
- (2) improve salmon management or to improve habitat conditions
- (3) Q I noted it might be a coincidence but your wife also is a biologist is that correct?
- (4) A That s correct
- (5) Q And does she participate in any of the research you do?
- (6) A We discuss it obviously She has a Ph D in fisheries She s a limnologist aquatic toxicologist She also worked in Alaska with salmon
- (7) Q Let me go back to upon you receiving your Ph D and sort of bring us forward in the experience you have that is relevant to what you re doing today and that is you did work as a project leader for the Fisheries Research Institute correct?
- (8) A That s correct
- (9) Q Could you describe your work beginning in 1989?
- (10) A 1989 I was project leader for the Alaska salmon program as a whole which primarily involved research in Bristol Bay but also Chignik One of my primary responsibilities was conducting and directing research in Chignik Lakes where we conducted a variety of studies I also supervised the research of several undergraduate students along with Dr Rogers
- (11) Q Have you also done some research on biology relating to fisheries in other areas of Alaska and out of state?
- (12) A That s correct I ve also conducted studies in the Kodiak

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- (1) management area Cook Inlet management area British Columbia
- (2) Washington and California
- (3) Q And in your work have you had experience doing work on run size reconstruction and estimation?
- (4) A That is correct
- (5) Q And could you tell us about what type of work you ve done?
- (6) A For the past ten years I ve developed forecasts of the Black Lake and Chignik Lake runs to the Chignik Lake system
- (7) For several years I also forecasted sockeye salmon to Bristol Bay and have been involved with run size estimation types of projects and involved in both Kodiak and Cook Inlet
- (8) Q Doctor have you published articles in this field?
- (9) A Yes I have
- (10) Q Could you give us not going through each one but a general overview of your work?
- (11) A A number of my studies have involved predator/prey interactions because in general we believe predation to be one of the major factors influencing salmon survival I ve also conducted studies involving salmon growth using scale patterns
- (12) to study growth in fresh water and the marine environment
- (13) conducted studies to separate stocks or identify stocks of adult salmon migrating back through the management areas through fisheries such as the Chignik area as well as the Kodiak management area
- (14) Q Let me ask you a question about professional societies that

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- (1) you ve had Again trying to be brief have you held any positions in any professional societies that would be relevant?
- (2) A Yes I m presently the northwest district director of the American Institute of Fisheries Research Biologists
- (3) MR SARKO Your Honor I m going to skip and ask that Dr Ruggerone be accepted as an expert on salmon fisheries including salmon biology and salmon run size estimation
- (4) MR LYNCH Your Honor I have questions on that subject but I don t object to acknowledgment of Dr Ruggerone in that field I d note for the record that Mr Sarko has not offered him on economics
- (5) THE COURT The Court will accept Dr Ruggerone s qualifications as a fisheries biologist
- (6) BY MR SARKO
- (7) Q Can we start with Plaintiffs Exhibit 306?
- (8) Doctor I m going to start by asking you we ve gone through several of the management areas starting with Prince William Sound to Upper and Lower Cook Inlet and Kodiak and I m going to ask you to continue down through the - the oil impacted region
- (9) There we go Sir can we start and can you identify Exhibit 306?
- (10) A Excuse me?
- (11) Q This is a Chignik management area correct?

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- (1) A Yes This the Chignik management area shown here It s on the south side of the Alaska Peninsula just west of the Kodiak Island area and it s outlined You can see the management area is shown here from this area all along here It s approximately 200 miles or so it s a very extensive management area where fishermen can harvest salmon
- (2) There are five different districts as shown here The outside areas are called cape fisheries and then there s also a fishery conducted here in the small area Chignik Lagoon
- (3) The primary species returning to this area at least the greatest economic importance is sockeye salmon Primarily two stocks of salmon returning There s an early run that goes to Black Lake here and a later run which overlaps with the Black Lake stock It returns to Chignik Lake down below it
- (4) Q Doctor let me ask you in addition to sockeye salmon what other species do fishermen catch in this area?
- (5) A Fishermen also catch coho salmon pink salmon chum salmon and king salmon The pink salmon and chum salmon are almost exclusively caught along the cape areas which I ve outlined here Coho salmon approximately 50 percent of those on average are caught along the cape areas the other 50 percent within this smaller lagoon area The lagoon area represents coho that are primarily returning to the lakes or there s an incidental catch of king salmon in both the lagoon and cape areas

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- (1) As I mentioned also 40 percent of the sockeye salmon that
 (2) are harvested in the whole Chignik management area are
 captured
 (3) along the cape area. Approximately 60 percent are captured in
 (4) the lagoon area
 (5) Q Let me stop you there and ask just a couple of things. One
 (6) is when you turn towards the picture unfortunately the
 (7) microphone doesn't pick you up so you need to speak up. But
 (8) let me clear the screen for a minute of your writing and let
 (9) me ask you - a lot of people haven't been there but the
 (10) entire management area on the outside that you described is
 (11) quite some distance isn't it?
 (12) A Right over 200 miles
 (13) Q Over 200 miles I want to direct your attention to 1989
 (14) the year of the spill and ask you to describe for the jury
 (15) what effect the Exxon Valdez oil spill had on the fisheries in
 (16) the Chignik management area
 (17) A In 1989 the oil spill had a major effect on the fishery
 (18) because oil drifted from the eastern portion of the management
 (19) area throughout the entire cape area
 (20) Q I think you need to - there you go
 (21) A Essentially covered the entire cape region of the Chignik
 (22) management area essentially eliminating fishing from the
 (23) capes so that the fishery was almost entirely limited to a
 (24) relatively small shallow Chignik Lagoon area. So
 (25) essentially we have about a hundred boats within this,

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- (1) management area
 (2) Q Doctor can you just for point of fact draw a circle where
 (3) the Chignik Lagoon area - the only area that was open for
 (4) fishing?
 (5) So in other words the circle represents the only area in
 (6) all of Chignik that was - fishing was allowed in 1989?
 (7) A For the most part
 (8) Q And what effect did that have on - on the fishermen's
 (9) harvest in 1989?
 (10) A Well obviously it greatly reduced their harvest of all
 (11) the different salmon species. There are a hundred purse seine
 (12) vessels within the Chignik management area. Many of these
 (13) vessels are deep draft approximately ten to 15 boats have deep
 (14) drafts also deeper seines. They typically fish the cape
 (15) areas and because - they do not go into the lagoon so those
 (16) fishermen were excluded from fishing during the 1989 period
 (17) These fishermen are also - tend to be better fishermen
 (18) what we also call high liners
 (19) Q And in fact you prepared Exhibit 350 which itemizes some
 (20) of those problems correct?
 (21) A That's correct
 (22) Q Can you go on? What other problems were there relating to
 (23) that fishery?
 (24) A The oil in addition to closing the cape region of the
 (25) Alaska Peninsula from fishing was - also caused the fishery

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- (1) within the lagoon to be closed six different times. Also
 (2) because the cape area was closed to fishing many of the
 (3) non local sockeye salmon which migrate through this area
 were
 (4) not allowed to be captured
 (5) Now in other years non local salmon that is fish
 (6) migrating outside - or heading towards areas outside the
 (7) Chignik management area are intercepted by Chignik
 fishermen
 (8) When Fish & Game develops their statistics for the Chignik
 (9) management area that is harvested within that management
 area
 (10) they essentially assume that those are - those non-local fish
 (11) are counted as part of the Chignik run in our historical data
 (12) base. But in 1989 because the fishermen were not allowed to
 (13) fish outside they could not take advantage of these non-local
 (14) sockeye salmon
 (15) That is I think very important because in 1989 the
 (16) Bristol Bay sockeye run which is one of the - the largest
 (17) salmon run in the world was having an exceptional year. The
 (18) run size to Bristol Bay was about 44 million sockeye salmon
 (19) Additionally as you know as Dr Rogers just testified
 (20) the Cook Inlet run was very large and these fish also migrate
 (21) through the cape area.
 (22) Q Let me stop you there and bring up this Exhibit 366 again
 (23) just to make sure I understand. Basically in Chignik there
 (24) are - it's a smaller fishery in number of boats in that there
 (25) are approximately how many?

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- (1) A Approximately one hundred
 (2) Q Approximately one hundred boats so what you're saying is
 (3) that the hundred boats which normally fish in the lagoon and
 (4) within the 200-mile limit all crowded into the lagoon and in
 (5) fact some of them were too deep and that they couldn't fish
 (6) at all?
 (7) A That's correct
 (8) Q And the second point I believe if I understood - if I
 (9) understood you right was that the fish that are normally
 (10) caught in the outside the 40 percent or whatever couldn't be
 (11) harvested because that area was closed?
 (12) A That's correct
 (13) Q And did that have particular effects for the pink salmon
 (14) harvest in Chignik?
 (15) A Obviously because essentially all of the pink salmon are
 (16) harvested along the capes and the fishermen were not allowed
 to
 (17) take advantage of those fish
 (18) Q Did you do some work to try to form an opinion and an
 (19) estimate of the amount of salmon that couldn't be harvested by
 (20) the fishermen because of the oil spill?
 (21) A Yes I did
 (22) Q And let me show you Exhibit 353. Maybe we can blow that
 up
 (23) a little but using this exhibit can you describe for the jury
 (24) what work you did to - to finally reach that opinion?
 (25) A Basically for this to estimate the - what the catch of

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- (1) the various salmon species would have been had there not been
- (2) an oil spill I used historical data dating back to 1978 I
- (3) used various methodologies depending on which method I thought
- (4) was most appropriate depending on the different species
- (5) involved here and made an estimate of sockeye salmon harvest
- (6) had there not been an oil spill for the two lakes the Chignik
- (7) Lake and Black Lake system because they are managed
- (8) separately as well as for coho salmon pink salmon chum and
- (9) chinook
- (10) The column on the left shows the actual catch observed in
- (11) 1989 as reported by the Alaska Department of Fish & Game
- The
- (12) middle column shows the estimated catch for each of the
- species
- (13) as shown there and then the column on the right shows the
- (14) difference between the two
- (15) Q And the difference column reflects in your opinion, the
- (16) number of each of the species that could not be caught due to
- (17) the closures in Chignik correct?
- (18) A That is correct. Can I answer that?
- (19) Q Sure
- (20) A I want to also mention that this estimate for sockeye
- (21) salmon is a conservative estimate in that it's low and that
- (22) the fishermen - this estimate does not include non local
- (23) sockeye salmon that would have been available to Chignik
- (24) fishermen had they been allowed to fish the cape region
- (25) Q In the interest of time I'm not going to go through all of

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- (1) these unless there are questions about them but you in fact
- (2) used individual models and looked at each of the species?
- (3) A That's correct
- (4) Q And you have - this is - for example Exhibit 359 you
- (5) have specific analysis on each of those species that you
- (6) performed?
- (7) A That's correct
- (8) Q Did you after you determined the number of fish that were
- (9) not caught translate that into a dollar figure?
- (10) A I did
- (11) MR LYNCH Your Honor this is the subject matter
- (12) that I think it seems Dr Ruggerone's qualification - I don't
- (13) have any problem if this is done as a mathematical projection
- (14) but I don't think there's any foundation for the price
- (15) MR SARKO Your Honor two points One this is
- (16) exactly the same analysis that Dr Rogers did that was done in
- (17) Prince William Sound In fact it's an identical exhibit and I
- (18) can lay a foundation for it
- (19) THE COURT I'll allow you to proceed but Mr Lynch
- (20) if you think it goes beyond the - the use of
- (21) uncontroversial -
- (22) MR LYNCH My only point is I don't have any
- (23) difficulty with Dr Ruggerone using prices that are actual real
- (24) world prices but I don't think he has been qualified to
- (25) project prices

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- (1) THE COURT That's exactly what I had in mind If you
- (2) feel it's getting off into the area of projections let us
- (3) know
- (4) MR O NEILL Could we - it'll solve a future problem
- (5) if we could talk about this right now It doesn't have to do
- (6) with this particular exhibit and I have a proposed solution
- (7) (At side bar off the record)
- (8) MR SARKO Thank you Doctor Thank you Your
- (9) Honor
- (10) BY MR SARKO
- (11) Q Let's go back to Exhibit 369 and could you tell us going
- (12) from Exhibit 353 which is your counting of fish do I
- (13) understand that 369 was the actual prices paid in 1989 and
- (14) translating those into dollars?
- (15) A That's correct
- (16) Q Take us through this quickly to show us how you got to your
- (17) final opinion
- (18) A Sure The top row in terms of foregone numbers came from
- (19) the previous table I just showed you that was additional fish
- (20) they could have caught if there wasn't a spill for each one of
- (21) the species
- (22) I used as average weight per fish the observed average
- (23) weight reported by Fish & Game presented in their annual
- (24) management report for 1989 The third row the foregone
- (25) harvest in terms of pounds is simply multiplying the average

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- (1) weight times the foregone harvest numbers and then finally
- (2) the fourth row shows the average price per pound for each one
- (3) of the species as reported in 1989 by the Fish & Game
- (4) management report again for each one of the species
- (5) The foregone value for each species is simply multiplying
- (6) the number of pounds times the average price per pound for
- that
- (7) species that's shown in the bottom row
- (8) Q Now is it your opinion that due to the closures caused by
- (9) the Exxon Valdez oil spill in the Chignik management area that
- (10) the fishing fleet was - their foregone harvest was not able to
- (11) catch fish with a value of \$5,944,172 valued in 1989 prices at
- (12) that time?
- (13) A That's correct.
- (14) MR SARKO Your Honor I'd like to offer Exhibit
- (15) 369
- (16) (Exhibit 369 offered)
- (17) THE COURT Is that not a -
- (18) MR LYNCH Your Honor I think we have an agreement
- (19) to hold off on this
- (20) MR O NEILL. On this one?
- (21) MR LYNCH I thought we were going to arrive at a
- (22) set
- (23) MR SARKO I don't think this one is a problem
- (24) MR O NEILL. The others have gone in
- (25) MR LYNCH All right

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- (1) MR O NEILL. Just for the sake of the record Your Honor what we had intended to do and what we have agreed to do
- (2) is put these exhibits in but we re going to try to winnow down the number of these exhibits that we send back to the jury room to something that is usable for the jury So while these exhibits are all being admitted we re going to try to come to some kind of mutual agreement on a core set of exhibits to go back to the jury room so we don t waste a lot of time and effort going through pieces of paper
- (3) Is that a fair statement Pat?
- (4) MR LYNCH It s a fair statement Some of the foundation standings alone might be subject to objection but I think we can work that out Your Honor
- (5) THE COURT Where does that leave us with 369?
- (6) MR O NEILL. It s offered
- (7) MR LYNCH And I withdraw my objection
- (8) THE COURT All right Plaintiffs 369 is admitted (Exhibit 369 received)
- (9) BY MR SARKO
- (10) Q Dr Ruggerone we have one more management area we have to talk about and then I think we re done and that is the Balboa Stepovak management area Let me ask you to use the Chignik management area map which is back there and if you can get your nifty ditty white pen out and explain to the jury what is Stepovak What is the Balboa Stepovak?

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- (1) A Balboa Stepovak area is the area I just outlined It s not within the Chignik management area it s in a separate adjacent management area you can see here And prior to July 25th fishermen were allowed to catch non local salmon primarily sockeye salmon And the management within this area is dependent on harvest escapements within Chignik management area somewhat different than most management plans in the state of Alaska
- (2) The criteria that they use to open close the fishery within the Balboa Stepovak area is dependent upon the harvest in the Chignik management area For example by July 25th the Chignik fishermen have to be on target to reach a harvest of 600 000 sockeye salmon plus escapements need to be on target within the Chignik management area the Chignik Lakes
- (3) Q So in other words the Balboa Stepovak catch or management decisions are linked to the Chignik management area?
- (4) A That s correct
- (5) Q And did the closures from the Exxon Valdez oil spill and the oil floating down there cause any change in 1989 in the Balboa Stepovak area and did it cause closures?
- (6) A Yes it did As I mentioned briefly the oil prevented the Chignik fishermen from fishing along the capes The cape area represents an area where they would catch non local sockeye salmon plus the fishermen would have caught salmon at an earlier date

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- (1) In addition it greatly hindered the management of the Chignik management biologists in terms of opening and closing the fishery and that is - what I mean by that is that the fishermen - or the manager when he opens fisheries in the outside areas he looks at the catch per effort that is the number of sockeye salmon caught per vessel And when he looks at that data if he can see that those boats on the outside areas are catching large numbers of fish that indicates to him that a large number of sockeye salmon are coming back towards the Chignik management area and it reassures him that he can keep the fishery open for a longer period of time while still achieving his escapement goals
- (2) Q Doctor did you reach an opinion as to the number of sockeye salmon that the fleet in Balboa Stepovak or the fishermen there could not catch due to the oil spill?
- (3) A Yes, I did
- (4) Q Did you prepare an exhibit Exhibit 368?
- (5) A Yes I did
- (6) Q See if this - it s on gray It might not show very well Can you please explain how you went about calculating this and what your conclusion is?
- (7) A I made an estimate of how many sockeye salmon the Balboa Stepovak fishermen could have caught based on a relationship between catch historical catch between the Balboa Stepovak area and the run size of sockeye salmon within the Chignik

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- (1) management area through July 25th And I used the observed - this is important - the observed run size through July 25th to make this estimate Therefore in a sense because the sockeye or the fishermen were not allowed to fish along the capes and catch non local sockeye these estimates are conservative estimates
- (2) I should also mention that Balboa Stepovak fishermen have had a fishery in every year since 1975
- (3) MR SARKO Your Honor I would - let me go back
- (4) BY MR SARKO
- (5) Q And is it your opinion that the Balboa Stepovak fishermen s - the value of their catch expressed in 1989 dollars prices at that time were \$317 842?
- (6) A That is correct
- (7) MR SARKO Your Honor we d like to -
- (8) BY MR SARKO
- (9) Q The damage just to make it clear that is the number that is the value of the fish that the fishermen there could not catch because of the oil spill that is their damage correct?
- (10) A That is correct
- (11) MR SARKO I d like to offer 368 Your Honor (Exhibit 368 offered)
- (12) THE COURT Is there an objection?
- (13) MR LYNCH No Your Honor
- (14) THE COURT Plaintiffs Exhibit 368 is admitted

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- (1) (Exhibit 368 received)
 (2) BY MR SARKO
 (3) Q Doctor I d like to now move onto a different subject and
 (4) that is that we ve been talking about 1989 In this case we
 (5) also – the jury has heard some evidence and will hear in the
 (6) coming days evidence relating to 1994 and 1995 Since you re
 (7) on the stand at this time though I want to ask you questions
 (8) about that
 (9) Were you asked to look at several fisheries which the
 (10) Plaintiffs will offer evidence that they believe are in
 (11) jeopardy and were you asked to develop an estimate of the
 (12) harvest of those fisheries in 1994 and 1995 but for the oil
 (13) spill
 (14) A Yes I was
 (15) MR LYNCH Your Honor may we approach the side bar
 (16) on this?
 (17) (At side bar off the record)
 (18) BY MR SARKO
 (19) Q Doctor let me start with the Upper Cook Inlet sockeye
 (20) fishery Just to be clear dealing with 1994 and 195 were you
 (21) asked to provide opinion – an opinion as to what the
 (22) harvest – what the harvest to the fishermen in Upper Cook
 (23) Inlet in 94 and 95 would be but for the oil spill? That is
 (24) not saying about what is going to happen but what that harvest
 (25) there in 94 and 95 what your prediction would be if there

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- (1) hadn't been an oil spill?
 (2) A That s correct
 (3) Q Let me try it again Were you asked to assume in 1994 and
 (4) 1995 if there hadn't been a season what the harvest would be
 (5) in Upper Cook Inlet?
 (6) A That s correct
 (7) Q Let me ask you how you went about your analysis what you
 (8) looked at?
 (9) A My analysis was quite straightforward I used this
 (10) approach because the uncertainty generated by the oil spill in
 (11) 1989 My analysis basically relied on historical years
 (12) primarily the past five years which included prespill and post
 (13) spill estimates of run size harvest average weight average
 (14) value
 (15) Q Let me – let me stop you there and say that as we
 (16) discussed at the side bar you re one of a number of witnesses
 (17) and I'm going to ask you to take us and the jury through your
 (18) analysis as far as you get with number of fish harvest and
 (19) weight and we ll leave value for another day
 (20) A Okay This table shows harvest of – future of harvest
 (21) damages to Upper Cook Inlet sockeye salmon The run size
 (22) estimates here show 1988 through 1993 are those published by
 (23) the Alaska Department of Fish & Game The average weight are
 (24) also Department of Fish & Game data. I simply took the
 (25) average
 (25) of these values as an estimate of future harvest damages in

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- (1) Upper Cook Inlet assuming that there would be no fishery in
 (2) 1994 and 1995
 (3) Q And you simply applied a straightforward average?
 (4) A That s correct
 (5) Q And did you perform a similar analysis for Kodiak?
 (6) A I did
 (7) Q And in Kodiak I think we have to have you explain you
 (8) looked at specifically only the runs relating to two of the
 (9) lakes in Kodiak correct?
 (10) A That s correct These are two lakes that have been
 (11) identified to have been affected by overescapement And
 (12) again I used the years 1988 through 1993 These are Fish &
 (13) Game data which I received directly from fisheries biologists
 (14) Bruce Barrett and Charlie Swanton The estimates of average
 (15) weight were available from the Alaska Fish & Game
 (16) management
 (16) reports
 (17) Q And the figures relating to run harvest and average weight
 (18) relating to Plaintiffs Exhibit 3820 are your estimate of what
 (19) the harvest would be for those lakes assuming that there would
 (20) be a closure?
 (21) A That s correct
 (22) Q Let me take you to one last area and that is Prince William
 (23) Sound Did you also do an analysis in Prince William Sound
 (24) relating to pink salmon?
 (25) A Yes I did

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- (1) Q And is that analysis shown on Plaintiffs Exhibit 3652?
 (2) A Yes it is Again my approach was the same as before
 (3) except this – with the pink salmon I separated out even year
 (4) and odd year estimates because pink salmon have a two-year
 (5) life
 (5) history The data here came from CFEC the Commercial
 (6) Fisheries Entry Commission and the data are reported in terms
 (7) of harvest pounds and average value
 (8) Q Doctor finally to sum this up the data shown in
 (9) Plaintiffs Exhibit 3652 relating to pink salmon in Prince
 (10) William Sound 3820 relating to Kodiak sockeye and the two
 (11) lakes you mentioned and 3653 relating to Upper Cook Inlet
 (12) sockeye the figures that you determined are those your
 (13) opinion as to the lost harvest for 94 and 95 assuming there
 (14) are closures?
 (15) A It is
 (16) MR SARKO I have no further questions
 (17) THE COURT You may cross-examine
 (18) CROSS EXAMINATION OF GREGORY RUGGERONE
 (19) BY MR LYNCH
 (20) Q Let me start with the last set of exhibits that you talked
 (21) about, Dr Ruggerone If I mispronounce your name don't
 (22) hesitate to correct me I m sure you ll correct me in any
 (23) other respect without prompting
 (24) The figures that you calculated and that Mr Sarko showed
 (25) the jury those represent your taking the total catch figures

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- (1) of ADF&G for certain years for certain species is that
- (2) correct?
- (3) A That s correct
- (4) Q And averaging those?
- (5) A That s correct
- (6) Q Is that basically what you ve done?
- (7) A That s correct
- (8) Q And the poundage likewise?
- (9) A That s correct
- (10) Q Except that in the case of pink salmon you didn t average
- (11) all the years together you averaged even years together and
- (12) odd years together?
- (13) A That s correct
- (14) Q And you selected different sets of years for the different
- (15) types of - of fish that you were talking about is that
- (16) correct?
- (17) A For the sockeye I selected 1988 through 93 For pinks
- (18) 1984 through 1991
- (19) Q And now with respect to the assumption that there would be
- (20) no season at all in 1994 and 95 I think you told us when you
- (21) were - your qualifications were being developed that you have
- (22) for a number of years actually done the forecasting or
- (23) forecasting in the Chignik area is that correct?
- (24) A That s correct
- (25) Q And you have done a projection for 1994 have you not?

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- (1) A That s correct
- (2) Q And you re projecting that there will be a catch of about a
- (3) million fish?
- (4) A Approximately that
- (5) Q And in -
- (6) A Actually I think the projection was a forecast harvest of
- (7) 750 000
- (8) Q A run of a million harvest of 750 000?
- (9) A Yes
- (10) Q And ADF&G agrees with that forecast broadly speaking, is
- (11) that correct?
- (12) A Yes
- (13) Q You re not really thinking that there will be no season in
- (14) 1994 you yourself?
- (15) A That s correct
- (16) Q It is not your opinion that there will be no fish caught in
- (17) Chignik this year is that -
- (18) A That s correct
- (19) Q Now let me go then to the Balboa Stepovak - Stepovak
- (20) or vik?
- (21) A vak
- (22) Q Stepovak fishery The way that fishery works as I
- (23) understand it is that the fish that pass by that area are
- (24) headed elsewhere?
- (25) A That s correct They re primarily non local

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- (1) Q Meaning they re not going to come in there to spawn is
- (2) that correct?
- (3) A That s correct There s a small sockeye lake there but
- (4) they attempt to manage that separately
- (5) Q And the primary concern from a management standpoint
- (6) that
- (7) they have in Balboa Stepovak are the fish that are headed for
- (8) your territory the Chignik area is that correct?
- (9) A There are fish that are heading from the Balboa Stepovak
- (10) area to the Chignik but as well as other areas
- (11) Q But in terms of a management criterion do they look at
- (12) whether the Balboa Stepovak fishery will interfere with the
- (13) returns of fish to Chignik?
- (14) A The Department of Fish & Game assumes for management
- (15) purposes that 80 percent of the sockeye harvested in the
- (16) Balboa
- (17) Stepovak area are headed for the Chignik system
- (18) Q And I think you testified when you were talking to
- (19) Mr Sarko that there are two runs two separate runs in the
- (20) Chignik area an early run and a late run is that correct?
- (21) A That s correct.
- (22) Q Now, in projecting the fact or the contention that there
- (23) was a lost harvest in 1989 you made the assumption that
- (24) fishing would be open in Balboa Stepovak is that correct?
- (25) A That s correct.
- (26) Q And you reached that did you not by looking at the total
- (27) escapement for the year and averaging it out?

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- (1) A Excuse me?
- (2) Q Did you - did you take the season long escapement to
- (3) Chignik and Black Lakes?
- (4) A Uh huh
- (5) Q And average that to determine what the - whether the
- (6) escapement goals for Balboa Stepovak would have been met in
- (7) 1989?
- (8) A You re - they don t have escapement goals for Balboa
- (9) Stepovak
- (10) Q Isn t it the case that in order to open Balboa Stepovak
- (11) they have to believe that the escapement goals at Black Lake
- (12) and Chignik Lake are going to be met?
- (13) A That s correct
- (14) Q And you had to satisfy yourself in trying to look back in
- (15) time and see what would have happened in '89 that those
- (16) goals
- (17) would have been met right?
- (18) A That s correct
- (19) Q And you did that by figuring the average escapement to both
- (20) lakes correct?
- (21) A No I don t -
- (22) Q Okay Well let me ask the question this way Isn t it a
- (23) fact that the run to Black Lake is early?
- (24) A Yes
- (25) Q Isn t it a fact that the run to Black Lake in 1989 was
- (26) weak?

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- (1) A To Black Lake was below average
 (2) Q And even without commercial fishing Black Lake did not meet its escapement goal for 1989 isn't that correct?
 (3) A That's not correct
 (4) Q Isn't it true that they had a goal of 400 000 and they only got 384 000?
 (5) A That's a post season analysis in season which is what the area manager is using obviously the values that he has in season they exceeded the escapement goal of 400 000 by 17 000
 (6) fish
 (7) Q You mean he miscounted during the season?
 (8) A Obviously there's variations There's a different analysis that takes place in a post season that's different than in season
 (9) Q So you think the right way to go about this if you're trying to figure out what would have happened in 1989 you're trying to reconstruct the judgments of those biologists would make you look at the information they had available to them at the time?
 (10) A That's correct
 (11) Q So in your point of view looking at a post season analysis of the escapement to Black Lake wouldn't tell you what the biologist would have done at the time is that correct?
 (12) A That's correct in terms of evaluating Balboa Stepovak
 (13) Q How would you feel about an analysis that came along two

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- (1) years later same principal?
 (2) A I don't understand what you're saying
 (3) Q Okay So your belief is that the - that the biologist in Chignik would have believed that they were getting enough fish back to Black Lake even though in fact they were having a weak run is that correct?
 (4) A In 1989 they were meeting their escapement threshold guidelines for the Black Lake run throughout the fishery
 (5) Q Now you're aware that ADF&G has analyzed that question Mr Barrett at ADF&G?
 (6) A I'm not aware that Mr Bruce Barrett conducted any analyses on this issue
 (7) Q You're aware that he conducted analysis of what the run would have been in Balboa Stepovak in 1989?
 (8) A I'm not aware that he's conducted an analysis
 (9) Q Are you aware he's published on the subject?
 (10) A I'm aware of the letter that Bruce Barrett said his opinion I guess that he did not think there would be a fishery in Balboa Stepovak
 (11) Q What was the basis of his opinion?
 (12) A He didn't provide any analysis I don't know
 (13) Q You didn't understand that his analysis was based on an opinion that there weren't enough fish getting to Black Lake to justify the Balboa Stepovak fishery?
 (14) A Again he just made a simple statement without giving any

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- (1) analysis
 (2) Q Let me ask you a couple of questions moving on from that about the - I didn't quite understand your answers about non local fish and whether you did or didn't count them in your re-creation Was your answer that you didn't count non local fish in your sockeye estimate?
 (3) A That's correct
 (4) Q But you did count them in the others?
 (5) A For coho salmon we would have
 (6) Q You used the historical data and regressed is that it?
 (7) A That's correct
 (8) Q My children do that We usually consider that a bad sign but -
 (9) A This is a different type of regression
 (10) Q This is a good regression Maybe I'll try that on them So you did contain the - you did count the non local fish based on historical records is that correct?
 (11) A Captured within the Chignik management area
 (12) Q Right Now in the case of your chum estimate your report the report you gave the plaintiffs lawyers indicated that your estimate was probably high is that correct?
 (13) A That's correct.
 (14) Q And that was - that was because using the regression technique you came up with kind of an outline?
 (15) A I didn't use a regression technique for chum salmon

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- (1) Q What did you use?
 (2) A I used the average and that is because in 1989 the Alaska Department of Fish & Game uses aerial surveys to estimate escapement of pink salmon and chum salmon along the capes
 (3) This technique as you've heard from other experts is not very accurate In other previous years the majority or 50 percent of the run is catch which is a good accurate estimate
 (4) In 1989 essentially all the fish escaped and estimates of run size in 1989 therefore were in my opinion highly inaccurate because the entire estimate of run was based on aerial counts
 (5) Furthermore in 1989 there was a severe flood that greatly affected Fish & Game's estimates of escapement into the streams
 (6) for both pink salmon and chum salmon
 (7) Q So when you wrote in your report to the plaintiffs lawyers that your estimate was probably high you didn't mean it?
 (8) A Yes I did
 (9) Q Oh okay
 (10) A Again my estimate for chum salmon was - was based on the average historical catch for that species
 (11) Q And that estimate was probably high?
 (12) A Right.
 (13) Q Okay Now the - in your coho estimate you estimated based - I'm a little lost here in my note Let me just take a second to read this

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- (1) You estimated on the historical driftnet to set net ratio?
- (2) A For which?
- (3) Q Your estimate of the lost coho catch in Upper Cook Inlet
- (4) I m sorry I m in the wrong -
- (5) A Wrong system
- (6) Q I m in the wrong system North Shelikof did you estimate
- (7) for that?
- (8) A I didn t make those estimates no You re in Kodiak
- (9) Q I m in someone else s territory
- (10) MR LYNCH I don t believe I have any other
- (11) questions Your Honor
- (12) MR SARKO I have nothing Your Honor
- (13) THE COURT Thank you sir You may step down You
- (14) may call your next witness
- (15) MR O NEILL If we could talk to Your Honor for a
- (16) second on the next witness
- (17) (At side bar off the record)
- (18) MR LYNCH The transcripts -
- (19) MR O'NEILL He stole your transcripts
- (20) MR JAMIN Your Honor plaintiffs call Dr Richard
- (21) Kocan
- (22) MR JAMIN There it is
- (23) THE CLERK Would you raise your right hand please
- (24) sir?
- (25) (The Witness Is Sworn)

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- (1) disciplines do you deal with cell culture and virus
- (2) identification?
- (3) A Yes I do
- (4) Q Do you deal with invitro methods for virus indication?
- (5) A Yes that s basically the same thing
- (6) Q With physiological effects of water pollutants?
- (7) A Yes in my own course
- (8) Q With medical effects of chemical pollutants?
- (9) A Yes That would be veterinarian and human health effects
- (10) Q And have you taught seminars on fish cell cytogenetics?
- (11) A Yes I ve given several seminars on the subject
- (12) Q Do you lecture in the department of pathology on
- (13) chromosomal injury?
- (14) A In the department of pathology and the school of public
- (15) health in the toxicology department
- (16) Q Do you teach principals of epidemiology?
- (17) A In my course yes
- (18) Q Have you taught seminars on the diseases of marine fish
- (19) resulting from exposure to environmental contaminants?
- (20) A Yes
- (21) Q And have you taught a seminar on the biological effects of
- (22) contaminated sea surface microlayer on developing herring
- (23) and
- (24) cod from North Sea and the Baltic Sea?
- (25) A Yes I ve given several seminars on that subject
- (26) Q How old are you sir?

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- (1) THE CLERK Please be seated For the record sir
- (2) state your full name your address and spell your last name
- (3) please
- (4) THE WITNESS Richard Michael Kocan That s spelled
- (5) K O C A N and my address is 7323 Pebble Beach Road
- (6) Suquamish
- (7) Washington
- (8) MR JAMIN
- (9) DIRECT EXAMINATION OF DR RICHARD KOCAN
- (10) BY MR JAMIN
- (11) Q Dr Kocan how are you employed?
- (12) A I m on the faculty of the University of Washington School
- (13) of Fishery
- (14) Q And in connection with your appointment do you teach?
- (15) A Yes I do
- (16) Q What do you teach?
- (17) A The course I m specifically responsible for is aquatic
- (18) toxicology and I also lecture in other people s courses
- (19) Q And in connection with the aquatic toxicology course do
- (20) you deal with issues of genetic toxicology?
- (21) A Yes I do
- (22) Q Do you deal with issues of cell culture and virus
- (23) identification?
- (24) A I do that in guest lectures to other courses
- (25) Q And either in connection with the course that you teach
- (26) directly or other courses where you teach in other people s

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- (1) A 53
- (2) Q And where did you get your bachelor s degree?
- (3) A Hiram College in Hiram Ohio
- (4) Q What did you study there?
- (5) A My major was general science and chemistry
- (6) Q And did you get a master s degree after that?
- (7) A Yes I did
- (8) Q Where was that?
- (9) A My master s degree was from Michigan State University in
- (10) East Lansing
- (11) Q What did you study there?
- (12) A Microbiology and public health
- (13) Q Did you go on to get a doctor s degree?
- (14) A Yes I did
- (15) Q Where was that?
- (16) A That was again at Michigan State University at East
- (17) Lansing
- (18) Q And the subject matter area sir?
- (19) A I m sorry?
- (20) Q The course that you studied in your - for your Ph D your
- (21) area of expertise?
- (22) A Oh well I took many courses covering many different
- (23) subjects in the department bacteriology, virology
- (24) parasitology immunology epidemiology
- (25) Q All right Did you have a particular subject matter for

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- (1) your dissertation for your Ph D ?
 (2) A Yes I did
 (3) Q What was that?
 (4) A It involved abnormal immune system development following infection
 (5) infection
 (6) Q That was immune systems?
 (7) A Immune system yes
 (8) Q Now since your doctoral degree have you done special course work?
 (9) course work?
 (10) A Yes I have
 (11) Q In what field?
 (12) A I took special course work training at the Public Health Service in Bethesda Maryland on medical mycology
 (13) Service in Bethesda Maryland on medical mycology
 (14) Q What is mycology sir?
 (15) A That s fungal study of fungi but in this case it would be pathogenic fungi
 (16) pathogenic fungi
 (17) Q And pathogenic means?
 (18) A Disease causing
 (19) Q And besides the course work at the United States Public Health Service have you done other special course work after your Ph D ?
 (20) Health Service have you done other special course work after your Ph D ?
 (21) your Ph D ?
 (22) A Yes I trained for several weeks at the Eastern Fish Disease Laboratory in Kearneysville or Lee Town West Virginia part of the U S Fish & Wildlife Service and the subject of that was fish subculture and virus isolation and

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- (1) doing or planning to do on the genetic damage resulting from the environmental contaminants
 (2) the environmental contaminants
 (3) Q Sir do you have any special experience regarding herring as a species of fish?
 (4) as a species of fish?
 (5) A I did a sabbatical in 1985 where I went to Germany and studied at the Biologische Amstalt Helgoland
 (6) studied at the Biologische Amstalt Helgoland
 (7) Q I won t ask you any more about that Doctor The judge told me not to ask you more about that
 (8) told me not to ask you more about that
 (9) THE COURT The reporter just closed her eyes
 (10) BY MR JAMIN
 (11) Q Go ahead sir
 (12) A There I studied with Doctors Rosenthal and Von Westernhagen who are the herring biologists for that institute
 (13) Westernhagen who are the herring biologists for that institute
 (14) institute
 (15) Q All right What sorts of things did you study while you were there?
 (16) were there?
 (17) A Dr Herald Rosenthal is an expert and rather well known specialist on the culture of embryonic and larval herring
 (18) specialist on the culture of embryonic and larval herring
 (19) He s written many papers with North American College primarily in Canada and I studied - I worked with him to learn his techniques and tried to adapt them to the type of work I was doing
 (20) in Canada and I studied - I worked with him to learn his techniques and tried to adapt them to the type of work I was doing
 (21) techniques and tried to adapt them to the type of work I was doing
 (22) doing
 (23) Q Was your own work in the field of herring at that time?
 (24) A I was - no it wasn t with herring at that time but it was being - it was in fisheries and contaminant research on

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- (1) identification
 (2) Q And have you had postdoctoral fellowships sir?
 (3) A Yes I ve had one postdoctoral fellowship
 (4) Q What was that in?
 (5) A That was in environmental pathology in medical school at the University of Washington
 (6) the University of Washington
 (7) Q And did you have particular areas that you focused on within environmental pathology when you were at the University of Washington Medical School?
 (8) within environmental pathology when you were at the University of Washington Medical School?
 (9) of Washington Medical School?
 (10) A Yes It was geneotoxic damage to cells as a result of exposure to environmental contaminants
 (11) exposure to environmental contaminants
 (12) Q And geneotoxic means?
 (13) A Damage to the genetic material of the cells
 (14) Q And how long a period were you involved with that postdoctoral fellowship?
 (15) postdoctoral fellowship?
 (16) A I was a postdoctoral fellow in that department for two years
 (17) years
 (18) Q And what does a postdoctoral fellow do or what did you - what did you do during that two-year period?
 (19) what did you do during that two-year period?
 (20) A During that time I worked with several of the faculty members in the department of pathology and with some faculty members in the physiology department - I m sorry pharmacology
 (21) members in the department of pathology and with some faculty members in the physiology department - I m sorry pharmacology
 (22) members in the physiology department - I m sorry pharmacology
 (23) department and I trained in their laboratones and learned techniques and protocols used by them in their research And these were protocols that would assist me in the research I was

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- (1) larval fish or embryonic fish
 (2) Q And have you since applied some of the techniques that you learned with the two German gentlemen in the herring field?
 (3) learned with the two German gentlemen in the herring field?
 (4) A Yes I ve used it quite extensively since that time
 (5) Q You have publications in that area?
 (6) A Yes I have
 (7) Q All right And with respect to your experience in aquatic toxicology can you advise us as to whether or not you ve done any research in that area?
 (8) toxicology can you advise us as to whether or not you ve done any research in that area?
 (9) any research in that area?
 (10) A Yes My primary research emphasis over the past, oh ten years has been in aquatic toxicology primarily marine toxicology, but I ve had some experience also with fresh water toxicology
 (11) years has been in aquatic toxicology primarily marine toxicology, but I ve had some experience also with fresh water toxicology
 (12) toxicology, but I ve had some experience also with fresh water toxicology
 (13) toxicology
 (14) Q And where have you received grants from to do that work sir?
 (15) sir?
 (16) A My research has been funded by the Environmental Protection Agency, the National Institutes of Health National Institute of Environmental Health Sciences the National Oceanic and Atmospheric Administration and the National Cancer Institute
 (17) Agency, the National Institutes of Health National Institute of Environmental Health Sciences the National Oceanic and Atmospheric Administration and the National Cancer Institute
 (18) of Environmental Health Sciences the National Oceanic and Atmospheric Administration and the National Cancer Institute
 (19) Atmospheric Administration and the National Cancer Institute
 (20) Q And do you have publications in the area of aquatic toxicology as well as herring?
 (21) toxicology as well as herring?
 (22) A I have - yes I have publications that are in aquatic toxicology and on herring that involve aquatic toxins
 (23) toxicology and on herring that involve aquatic toxins
 (24) Q And do some of those publications deal with the effects of contaminants and hydrocarbons on fish embryos and fish

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- (1) chromosomes?
 (2) A Yes they do
 (3) Q Does that include publications not only in the United States but also in foreign countries as well?
 (4) A Yes I've published my work that I did in Germany and I've done some work with Canadians and I published that also
 (5) Q And have you done or have you published in the area of the sea surface microlayer sir?
 (6) A Yes That was the primary focus of my research while I was in Germany
 (7) Q Just for a moment, what is the sea surface microlayer?
 (8) A The sea surface microlayer is a very small thin layer on the surface of the sea, just a few microns thick microscopic for all practical purposes and it's composed of a concentration of chemical compounds or biological compounds
 (9) that are derived from the breakdown of animal and plant organisms from the sea.
 (10) Q All right. Now in your course on aquatic toxicology, do you deal with issues involving the fate and transport into the marine environment of petroleum compounds?
 (11) A Yes, petroleum and other chemicals
 (12) Q Does the course include instruction on the various components of crude oil and how they impact the marine environment?
 (13) A Yes It covers various toxic components of petroleum and

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- (1) petro chemicals
 (2) Q Does the course you teach include the principal processes by which oil is integrated into the marine ecosystem?
 (3) A Yes it does
 (4) Q And have you given testimony before in federal courts in the area of aquatic toxicology?
 (5) A Yes I testified in the federal district court in Boise Idaho
 (6) Q What did that involve sir?
 (7) A That case involved a spill of an agricultural chemical into the Little Salmon River and the subsequent sterilization of that river for 25 miles downstream
 (8) Q Let me ask you finally about your experience in the area of genotoxicity, and have you done research in that area, sir?
 (9) A Yes The majority of my aquatic toxicology work is emphasized genetic damage or genotoxicity
 (10) Q And did you have any work in the area of genotoxicity that you did at the University of Washington's medical school?
 (11) A Yes I did - the two-year post doc. I did involved human chromosome damage in people exposed to a variety of different types of environmental contaminants or mutagens and carcinogens
 (12) Q And after your work of the effects of toxic substances and carcinogens on humans did you go on to apply that in the area of herring?

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- (1) A Yes I - following my postdoctoral fellowship and my tenure as a - on the faculty at the medical school I directed my work toward aquatic studies or application of these techniques and methods I used to aquatic toxicology and aquatic contamination problems
 (2) Q Sir do you have publications in the area of genotoxicity as well?
 (3) A Yes I do
 (4) MR JAMIN Your Honor I would offer Dr Kocan as an expert in the field of the biology of herring in aquatic toxicology and in genotoxicity
 (5) MR COOPER Your Honor the man behind the bar gets to speak. Your Honor, I have no problem with that, but there is one matter that I think we could - might probably take up briefly at the side bar
 (6) (At side bar off record)
 (7) THE COURT The Court accepts the witness' qualifications in the area of aquatic toxicology, genotoxicity and what was the third one?
 (8) MR JAMIN The biology of herring Your Honor
 (9) THE COURT Biology of herring I lost the simple one
 (10) MR JAMIN Your Honor I'm not sure any of them are simple but we'll find out over the next hour or so
 (11) THE COURT I'll rephrase that the one that was easy

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- (1) to say
 (2) MR JAMIN And our job sir is to try and make them as simple as we can Let's give it a start.
 (3) BY MR JAMIN
 (4) Q Before we get into your own science in this case, can you explain to the ladies and gentlemen of the jury how a scientist such as you goes about reaching opinions?
 (5) A Well, there are three basic methods that scientists can use to reach an opinion The first is to make observations and on the basis of the observations to draw conclusions
 (6) The second method is to ask questions or form hypotheses and then perform experiments to answer these questions and analyze the data from the experiments and use these data to answer the questions.
 (7) And the third is to synthesize the data that's already available that has been produced by other investigators and other scientists And on the basis of all of the known facts and known and available data, draw conclusions on some scientific matters
 (8) Q Can you give us an example of that first area of science that you described, the objects variable area?
 (9) A Okay If - if a scientist were to be working in the field say an ornithologist, and he observed a particular species of bird laying its eggs in another bird's nest, and he saw that the second species the bird whose nest the eggs were

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- (1) laid in incubated those eggs hatched the eggs raised them
 (2) and they successfully hatched and fledged the scientist could
 (3) come to the conclusion that the first bird was a parasitic
 (4) species that is it parasitized the nest of another species
 (5) and he did this by observation and drawing conclusions based
 on
 (6) what he had seen
 (7) In the second situation observations are made and on the
 (8) basis of the observations the scientist asks questions and
 (9) these questions are the basis for a hypothesis and he then
 (10) designs experiments that give him data that he uses to answer
 (11) the questions that he s asked and on the basis of the data or
 (12) the answers he s gotten he draws conclusions regarding the
 (13) initial question he s asked
 (14) And in the third method scientists synthesize the data of
 (15) other investigators other scientists information that s known
 (16) from the past and that s being generated in the present They
 (17) put all this information together and they come to conclusions
 (18) draw conclusions based on this other type of information
 (19) A classic example of this would be Watson Crick s discovery
 (20) of the chemical nature of the helical structure of the DNA
 (21) molecule They did no experimentation on their own but draw
 (22) entirely on the data and information generated by other
 (23) investigators
 (24) Q And did they receive the Nobel prize for that sir?
 (25) A Yes I think they shared the Nobel prize for that

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- (1) observation
 (2) Q Are all three types of science that you described good
 (3) science?
 (4) A Yes All three of these sciences these methods are
 (5) acceptable and they re used in varying degrees in different
 (6) fields of science
 (7) Q All right Now sir did you - did you do some work for
 (8) the - a natural resource damage assessment for the Trustees
 (9) that is the federal and state government after the oil spill?
 (10) A Yes I did
 (11) Q By whom were you hired?
 (12) A I was initially hired it was through Department of
 (13) Justice but I believe I worked for the State at that time to
 (14) review projects and review data that was generated by the
 (15) initial studies following the Exxon Valdez spill
 (16) Q And did you have a particular area that you were called on
 (17) by the Trustees in which to do research?
 (18) A Subsequent to that particular assignment I was asked to
 (19) participate in a study on the effects of petroleum and effects
 (20) of the oil spill on herring in Prince William Sound
 (21) Q All right And in connection with your - your work in
 (22) that particular area did you become familiar as well with the
 (23) work that other scientists were doing for the natural resource
 (24) damage assessment process in the area of herring?
 (25) A Yes Initially I was reviewing other people s projects

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- (1) and results and subsequent to that when I was doing my own
 (2) project or I was the principal investigator of my own project
 (3) I had to integrate my work with that of several other
 (4) investigators that were also working with herring at that time
 (5) and some had been working since 1989 I entered the program
 in
 (6) 1991
 (7) Q All right And can you - can you name some of the
 (8) investigators because we re going to - we re going to come
 (9) back and talk about their work a bit who were involved in
 (10) herring investigations besides yourself?
 (11) A The project leader for the whole herring project was Ms
 (12) Evelyn Biggs who s a herring biologist for the department
 (13) of - the Alaska Department of Fish & Game Dr Gary Marty is
 (14) a veterinary histopathologist at the University of California
 (15) Davis Dr Brendan Norcross University of Alaska at
 (16) Anchorage, is an oceanographer and she was involved in
 studies
 (17) on herring larvae and Dr Mike McGurk of Triton I don't
 (18) recall - Triton is the name of a company consulting firm He
 (19) works for British Columbia He also worked on the early stages
 (20) of the study And Dr JoEllen Hose of Occidental College in
 (21) California worked on the cytogenic and deformity studies in
 (22) the herring
 (23) Q Now with respect to your own research rather than work
 (24) with the other scientists but your own particular focus did
 (25) you do a laboratory study in 1991?

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- (1) A Yes In 1991 I conducted a laboratory study
 (2) Q And what in a very general way what did that involve
 (3) sir?
 (4) A The study was designed to evaluate the effect of Exxon
 (5) Valdez crude oil on developing herring embryos under
 controlled
 (6) laboratory conditions
 (7) Q And did you subsequent - and we ll come back to that
 (8) Doctor as you might imagine but did you subsequently do
 (9) another study in - later on?
 (10) A Yes I was - I did several studies That same year I
 (11) also did a study in the field
 (12) Q What did that involve? Again very generally
 (13) A That involved artificially spawning herring and putting the
 (14) newly fertilized eggs in the field at previously oiled and
 (15) unoiled sites and then retrieving them after ten to twelve
 (16) days and determining whether or not there were any differences
 (17) in the development or survival of these embryos from the
 (18) different sites they were exposed at.
 (19) Q Some were oiled sites and some were unoiled sites?
 (20) A Right Half at oiled sites and half were at unoiled sites
 (21) Q And in 1992 were you also involved in a subsequent study?
 (22) A Yes In 1992 I did a study in conjunction with ADF&G
 (23) again and this involved reproductive impairment, and we
 looked
 (24) at individual herring collected in oiled previously oiled and
 (25) previously unoiled sites and attempted to determine whether or

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- (1) not there was a difference in the survival rate of their
 (2) offspring dependent on which site we collected them at.
 (3) Q All right. Now was your work published sir?
 (4) A There was - the work that I did on the herring in Prince
 (5) William Sound?
 (6) Q Yes sir
 (7) A The - there is a final report that covers all of the work
 (8) that I completed that has been submitted to the Trustee Council
 (9) and two of the three projects have been accepted for
 (10) publication in the Canadian Journal of Fisheries and Aquatic
 (11) Sciences. And the third one has been written but is still
 (12) waiting one component by Dr. Marty, who hasn't yet completed
 (13) his phase and it's being submitted.
 (14) Q All right. Did your involvement with the plaintiffs in
 (15) this courtroom begin after your work with the Trustees?
 (16) A I was approached by the plaintiffs following the completion
 (17) of my work and after it was all presented at the Exxon Valdez
 (18) symposium that occurred in Anchorage in January or February
 (19) of
 (20) 1993.
 (21) Q Now sir let me get on to some of the substance and let us
 (22) learn a little bit about herring maybe more than we ever
 (23) wanted to know about herring.
 (24) As a starting place I'd like to call upon your expertise
 (25) in the area of the biology of herring, and I'd like to start,
 (26) if we can to have you explain in a generalized way the herring

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- (1) life cycle
 (2) A Is this my magic wand?
 (3) Q There should be a magic wand there, sir. With reference to
 (4) Plaintiffs Exhibit 482 can you explain generally the herring
 (5) life cycle?
 (6) A Yes. Can you all hear me if I speak like this?
 (7) This figure represents a schematic diagram of what herring
 (8) do over a period.
 (9) Q Perhaps a little louder Doctor.
 (10) A This represents a diagram. This diagram represents what
 (11) herring do during the course of their normal life cycle. And
 (12) here the upper portion of the figure you see representation
 (13) of kelp. This could be fucus or eelgrass or any of the other
 (14) large kelps that are present in Prince William Sound. And this
 (15) is a substrate on which herring lay their - frequently lay
 (16) their eggs and the eggs that incubate on this material for up
 (17) to 21 days and then hatch.
 (18) Once they hatch then we have a stage that is known as
 (19) larvae and the earliest stages of the larvae still have the
 (20) yolk attached to them. It's called a yolk sac and they live
 (21) off this yolk material while it's being absorbed and they also
 (22) grow. During the first ten to twelve days following hatching
 (23) they live right at the surface of the sea, right at the
 (24) air/water interface and they actually orient themselves in a
 (25) vertical position and try to maintain that position. And the

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- (1) only time they're removed is if there's some churning of the
 (2) water and the forces of the water push them down.
 (3) As they get older and older they begin to distribute more
 (4) and more widely through the water column and the water
 (5) column.
 (6) meaning that part of the water between the surface and the
 (7) bottom. And by the time they're about 45 days old they have
 (8) distributed themselves pretty well throughout the water column
 (9) and are able to swim against current.
 (10) Up until that time they've been subject to drifting with
 (11) the currents because they weren't able to - they weren't
 (12) strong enough or able to swim against these currents, do
 (13) wherever they happen to be at the time of the metamorphosis
 (14) that is became strong enough to swim against the current.
 (15) That's where they settled out and became - or began their life
 (16) as a juvenile fish.
 (17) Now as the juveniles one and two year old fish they tend
 (18) to stay segregated from the rest of the spawning population.
 (19) They do mix to some extent, but by and large they don't
 (20) integrate with the spawning population until they reach three
 (21) years old. And at three years old 30 some percent, on
 (22) average, begin to integrate with the spawning population but
 (23) don't actually begin spawning at that time. Now this can
 (24) range anywhere from zero to perhaps 50 to 60 percent,
 (25) depending
 (26) on the size of the class. This is quite variable.
 (27) By four years old however the fish have begun to

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- (1) integrate and mix with and become a part of the spawning
 (2) herring population and they are actively spawning. And at
 (3) this time ordinarily one would expect over 60 percent of
 (4) the - that year class that is those that were hatched from
 (5) this group of eggs, to be incorporated into the spawning
 (6) population. That's at four years old.
 (7) And then five years old they're 80-plus percent
 (8) incorporated, and then virtually all of them are in the
 (9) spawning population until they die. And herring live in Prince
 (10) William Sound, they can live as long as 13 years, but generally
 (11) by eight to nine years they've - the transition rate has
 (12) taken them out, and so there's virtually none left in the
 (13) population after nine years old.
 (14) Q All right. Sir, given - given these numbers, when would
 (15) you expect herring that were embryonic, that would have been
 (16) the subject of spawning in 1989, to first start coming back as
 (17) spawning fish themselves?
 (18) A Traditionally you would expect to see the first ones
 (19) entering at three years old so that would be in 1992.
 (20) Q Then would a substantially larger group come in in 1993?
 (21) A 1993 a much larger group would enter the population and
 (22) that's the first year you would expect to see them actively
 (23) spawning or participating in the spawning with the rest of the
 (24) population.
 (25) Q And by 1994 would the group be fully recruited?

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- (1) A By 1994 they would be over 80 percent recruited
 (2) Q All right Now you described a phase and I think it was
 (3) early on where the larvae were floating on the - or were on
 (4) the surface or near the surface During that phase are the
 (5) larvae subject to the movement of the water?
 (6) A Yes They re - until they metamorphose that is until
 (7) they reach the stage where they are capable of swimming
 against
 (8) the currents which is about 45 days I believe they are
 (9) subject to drift wherever the currents take them
 (10) Q All right Now in this - this normal herring pattern
 (11) are there some particular years or year classes that are larger
 (12) than others?
 (13) A Yes Classically there s one large year class that
 (14) dominates all of the spawning population and this occurs this
 (15) cycle is about every four years a new group of fish comes into
 (16) the spawning population and becomes the dominant class
 That
 (17) means that the majority of the spawning fish are made up of
 (18) that one-year class
 (19) Q Is the life cycle that you've described using the exhibit
 (20) that we have in front of us pretty much the same way that
 (21) herring works in areas of Alaska other than Prince William
 (22) Sound?
 (23) A Yes Most of the Alaskan - the herring in Alaskan waters
 (24) from Southeast up to the Alaska Peninsula have this four year
 (25) life cycle - or have this initial four-year life cycle and

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- (1) respond pretty much the way I ve described
 (2) Q All right Now do you have a series of photographs that
 (3) you ve asked me to put together to demonstrate some of the
 (4) phases along the way here sir?
 (5) A Yes
 (6) Q Try and pull up the first which is 471
 (7) Can you explain to us what s going on in this 471 sir?
 (8) A Yes I ll give it a shot This - this picture represents
 (9) the developmental stages of the herring from fertilization
 (10) until just prior to hatching or until it s a fully developed
 (11) larva inside the egg And this can be broken down into two
 (12) broad categories The first broad demarcation would occur at
 (13) about this point
 (14) Q It may be too dark to be able to use the pen
 (15) A Doesn t seem to put anything on there
 (16) Q The background may be just too dark If you d like to
 (17) sir and with the Court s permission I could have you stand
 (18) down and just point on this one exhibit - there you go You
 (19) got a green color that works?
 (20) A We ll settle for what we have here
 (21) All of the stages from fertilization through this stage
 (22) that s got the multiple green marks on it, are stages of the
 (23) embryo that precede the differentiation of the cells That
 (24) means that all of the cells during this period of time are
 (25) virtually identical

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- (1) We don t have brain cells and liver cells and kidney
 (2) cells We have embryonic cells and these cells are
 (3) represented if you look in here by see a single cell that
 (4) becomes fertilized then you have two cells That s one cell
 (5) division and cell divisions go on doubling These cells have
 (6) four eight sixteen et cetera We end up with hundreds and
 (7) thousands of cells making up this early embryo but like I
 (8) said up to this point up to here all of these cells are
 (9) virtually identical They look one like another and you can t
 (10) tell which is going to be kidney or spleen or liver or gonad or
 (11) brain
 (12) After this point the cells begin to differentiate and the
 (13) tissues begin to form and as the tissues begin to form you
 (14) start to see an embryo forming and one of the first things you
 (15) see is an eye starting to show up You can see it right there
 (16) in that embryo And as we proceed through more and more
 and
 (17) more hours you see that the embryo grows larger fins begin to
 (18) develop muscles develop the eye becomes colored the ears
 (19) develop the lenses in the eye You can see the heart beating
 (20) inside of this organism if you look at it under a microscope
 (21) and from this point on then you start to have differentiated
 (22) tissue or tissue that is becoming what it s supposed to be and
 (23) beginning to function the way it s supposed to
 (24) The critical thing here and the business that I attend to
 (25) and that is toxicology is that these two sides the two sides

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- (1) of this line respond differently when exposed to the same type
 (2) of toxic substance If the very earliest stages where there
 (3) are just a few cells are exposed to a toxic substance
 (4) generally the organism dies and it never develops but once it
 (5) starts to develop several hundred or several thousand cells
 (6) then damage occurs That s usually seen as a deformed
 organism
 (7) or birth defect when the thing finally hatches
 (8) If the damage occurs or if the exposure occurs after this
 (9) time when the tissues begin to develop and start to function
 (10) as normal tissue cells the types of damage that result are
 (11) quite different. Then they begin to be more long term types of
 (12) damage
 (13) Classical one that I've done some work on is very well
 (14) represented in literature If you expose older embryos to
 (15) petroleum hydrocarbons or a number of other types of toxins
 (16) when they grow up and become adults they develop tumors or
 (17) cancer
 (18) MR COOPER Excuse me Your Honor I'm a little
 (19) concerned we re getting into a long narrative here and I m not
 (20) sure I ll have the opportunity to make an objection should one
 (21) arise
 (22) THE COURT See if we can tighten down just a little
 (23) bit to question and answer form just a little bit
 (24) BY MR JAMIN
 (25) Q Why don t you complete your point Doctor and I'll move on

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- (1) to another question
 (2) A Okay What I m saying is physiological changes occur more
 (3) often in the older embryos in the older embryo than the
 (4) earlier embryo The earlier embryos develop some type of birth
 (5) defect.
 (6) Q All right. Now let me ask you if you can identify the
 (7) next photograph and tell us what this is
 (8) A Yes This is a photograph of actual live herring embryos
 (9) and this - they represent the earlier stages If you look
 (10) right here you can't see - maybe I can -
 (11) Q Can you make reference to the particular segment or the
 (12) quadrant of the diagram and that may help us?
 (13) A Can you see the pointer?
 (14) Q The pointer we can see now
 (15) A Can you see my pointer?
 (16) Q Yes
 (17) A Right there where that little red dot is that dark colored
 (18) arrow or that white area is cap of cells, several thousand
 (19) cells growing around the yolk. And the yolk is that sort of
 (20) clear area on the inside of the larger bubble and the larger
 (21) bubble that you see there is the chorion or the egg shell of
 (22) the embryo
 (23) Q And do we have a somewhat subsequent stage with 4737
 (24) A Yes Here in 473 you can see the embryo This is the
 (25) outline of the egg shell right here This is the embryo's eye

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- (1) Those are the types of animals you see hatching Then as
 (2) they get older and older they begin to look more and more like
 (3) a herring, and the metamorphosed herring, the one that is able
 (4) to swim on its own is represented by this group down here and
 (5) they're about 45 days old And the ones that I've worked with
 (6) almost exclusively in my work has been those just post
 (7) hatching so I've been looking at what has happened to them as
 (8) a consequence of what they were exposed to as embryos in the
 (9) egg
 (10) Q All right. Switching just a moment, Doctor, to your
 (11) expertise in the area of aquatic toxicology, can you explain to
 (12) the ladies and gentlemen what affect petroleum release has on
 (13) herring? And have you asked that I create some exhibits to
 (14) deal with that as well?
 (15) A Yes
 (16) Q Let's call up the first of them then sir Explain
 (17) please to the ladies and gentlemen what's going on with
 (18) number
 (19) 484
 (20) A Okay This is a slide that I use in my class lectures to
 (21) explain what happens in general to petroleum when it goes into
 (22) the marine environment. And as you can see there's an oil
 (23) slick leaking from the tanker the ship at the very top, and
 (24) this is what most people see and it's the most obvious
 (25) component of oil but what happens immediately after the oil is
 released is that the very lighter molecules - petroleum being

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- (1) this is the embryo's head and you can see the body twisting
 (2) around like so That's a developing embryo He's gone on to
 (3) the stage where the tissues have begun to develop and you
 (4) can
 (5) see actual organs starting to form inside the animal
 (6) Q And sir with 474 do we have a later stage that you can
 (7) describe to the jury?
 (8) A Yes This - this is a slide of herring embryos just prior
 (9) to hatching You can see the eyes are pigmented These two
 (10) dark objects - doesn't seem to be writing, but the two dark
 (11) objects in each of those eggs are the eyes You can see the
 (12) ears developing They're the kind of clear organs just behind
 (13) the eyes And you can see that the little beast is wrapped all
 (14) around the yolk and just waiting to pop out of the shell when
 (15) the time comes
 (16) Q All right. And with Exhibit 510 do we have a depiction of
 (17) the subsequent stages of herring larval development?
 (18) A Yes Once they hatch then the larvae go through a series
 (19) of growth changes and metamorphosis The very top figures
 (20) here the very top embryo or larvae that you see these three
 (21) at the very top are what one ordinarily sees immediately
 (22) following hatching They still have their yolk sacs attached
 (23) They can be more or less developed They may have to go
 (24) through a little bit more development yet Sometimes the
 (25) mouth
 (26) is not fully developed sometimes it is depending on the types
 (27) of conditions they incubate in

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- (1) made up of thousands of different chemicals the very lighter
 (2) chemicals begin to evaporate These go into the atmosphere
 (3) and
 (4) are lost.
 (5) Other components are mixed with oil - or mixed with water
 (6) rather and you can have oil and water emulsions or water and
 (7) oil emulsions basically the same sort of thing you get when
 (8) you shake up oil and vinegar salad dressing The oil and
 (9) vinegar mixes together for a short time then they begin to
 (10) separate again You get this kind of mixing Some cases you
 (11) have water and oil emulsions and others oil and water
 (12) emulsions And what's left -
 (13) Okay From those two some of the molecules then that are
 (14) still the very smallest molecules dissolve into the water In
 (15) addition to those that dissolve into the water there's also
 (16) small droplets ranging in size from microscopic to visible
 (17) that are also mixed in like your oil and vinegar dressing into
 (18) the water and these become bound with particulate materials in
 (19) the water column and are frequently sedimented out to the
 (20) bottom And there they come in contact with whatever
 (21) vegetation or plant or animal life that's there or they're
 (22) bound or mixed with the sediment material
 (23) I lost my picture
 (24) Q You got it back again?
 (25) A I didn't want it back
 (26) Q Are you trying to get a particular section sir?

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- (1) A I m trying to blow up a section
 (2) Q Is it the lower left hand quadrant?
 (3) A Solution okay This is the component that I ve dealt with
 (4) most in my studies that is that part or component of
 (5) petroleum that goes into the water The rest of it I let other
 (6) people work with
 (7) Okay And there s two phases as I mentioned One phase
 (8) is solution That is where the components the light
 (9) components are actually dissolved into the water such as salt
 (10) or sugar would dissolve into water and these components are
 (11) called the gasoline and diesel range hydrocarbons
 (12) The second component that doesn t really go into solution
 (13) but makes more of an emulsion is whole oil and this whole oil
 (14) is present in the form of droplets ranging in size from
 (15) microscopic to visible with the naked eye And this material
 (16) is distributed throughout the water column into the sediment
 (17) and is - interacts with the various components of the manne
 (18) environment following its introduction
 (19) MR JAMIN I think this may be a good time to break
 (20) THE COURT Ladies and gentlemen we ll adjourn at
 (21) this time Please remember my instructions about not listening
 (22) to or watching any media broadcast about our case We will
 (23) reconvene at 8 00 tomorrow morning
 (24) Do I need to see counsel about things today?
 (25) MR O NEILL. I wanted to give you a progress report

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- (1) and that s all
 (2) THE COURT Fine The jury is excused and counsel
 (3) will remain for just a moment please
 (4) (Recess at 2 00 p m)

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- (1) I N D E X
 (2) CONTINUED DIRECT EXAMINATION OF KENNETH P
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 (3) BY MR O NEILL. 4509
 (5) CROSS EXAMINATION OF KENNETH P PARKER
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- (1) DIRECT EXAMINATION OF DR RICHARD KOCAN
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 (2) BY MR JAMIN 4684

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(1) EXHIBITS	
(2) 5665 A offered	4638
(3) 5810-A offered	4649
(4) 369 offered	4666
(5) 388 offered	4670
(7) 5665-A received	4638
(8) 5801 A received	4649
(9) 369 received	4667
(10) 368 received	4671

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- (1) STATE OF ALASKA)
- (2) Reporter s Certificate
- (3) DISTRICT OF ALASKA)
- (6) I Joy S Brauer a Registered Professional
- (7) Reporter and Notary Public
- (8) DO HERBY CERTIFY
- (9) That the foregoing transcript contains a true and
- (10) accurate transcription of my shorthand notes of all requested
- (11) matters held in the foregoing captioned case
- (12) Further that the transcript was prepared by me
- (13) or under my direction
- (14) DATED this day
- (15) of 1994
- (21) JOY S BRAUER RPR
Notary Public for Alaska
- (22) My Commission Expires 5-10-87

Look-See Concordance Report

 UNIQUE WORDS 2,961
 TOTAL OCCURRENCES 15,253
 NOISE WORDS 385
 TOTAL WORDS IN FILE 44,661

SINGLE FILE CONCORDANCE
CASE SENSITIVE
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**INCLUDES ALL TEXT
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(1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 In re:) Case No. A89-0095 CIV (HRH)
 (5)) Anchorage Alaska
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 (6)) 8:00 a.m.
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 (9) TRIAL BY JURY 32nd DAY
 (10) BEFORE THE HONORABLE H. RUSSEL HOLLAND JUDGE
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(1) PROCEEDINGS
 (2) (Jury in at 8 00)
 (3) THE CLERK All rise
 (4) (Call to Order of the Court)
 (5) THE COURT Good morning ladies and gentlemen This
 (6) is the continuation of trial in Case A89-0095 civil in re The
 (7) Exxon Valdez We re still on the direct examination of Mr
 (8) Kocan Dr Kocan
 (9) THE WITNESS Kocan
 (10) THE COURT You understand you re still under oath?
 (11) MR O NEILL If we could take about three minutes and
 (12) admit some exhibits it would save us some time during Dr
 (13) Kocan s testimony and thereafter Plaintiffs Exhibit Numbers
 (14) are 471 472 473 474 475 477 478 479 480 481, 488, 501
 (15) 508 773 775, 433 434 435 and 436
 (16) (Exhibits 471 472 473 474 475 477 478 479 480 481,
 (17) 488 501 508 773 775 433 434 435 and 436 offered)
 (18) THE COURT I understand there is no objection to
 (19) these exhibits?
 (20) MR COOPER That's correct Your Honor
 (21) THE COURT The exhibits announced by Mr O Neill are
 (22) admitted
 (23) (Exhibit 471 472 473 474 475 477 478 479 480 481
 (24) 488 501 508 773 775 433 434 435 and 436 received)
 (25) CONTINUED DIRECT EXAMINATION OF RICHARD KOCAN

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(1) BY MR JAMIN
 (2) Q Dr Kocan yesterday when we ended the testimony we had
 (3) talked about the dissolution of petroleum into the water column
 (4) and the churning when the petroleum entered the water
 column
 (5) I want to move now to ask you whether petroleum components
 (6) those that you ve described which enter the ecosystem this
 (7) way have any toxic effects on fish found in that ecosystem?
 (8) A Yes they do
 (9) Q And let me call up 465 and in reference to this exhibit
 (10) sir could you explain to the ladies and gentlemen of the jury
 (11) what sorts of effects there are?
 (12) A Yes This is a list of classical toxic end points that
 (13) I ve prepared and it describes three basic types, that is
 (14) acute subchronic and chronic effects Acute means it happens
 (15) relatively quickly chronic means that it takes a longer period
 (16) of time and subchronic meaning that it s someplace in
 (17) between And under acute I have lethality irritability and
 (18) necrosis which means death irritability which means that the
 (19) organism is uncomfortable and behaves irrationally and
 (20) necrosis which is cell death birth defects and
 (21) reconstructive changes are categorized and then carcinogenic
 (22) And the life span of the animal and tissue degeneration over a
 (23) long time is listed under chronic and these are the types of
 (24) end points - some of the many end points that toxicologists
 (25) look for when organisms are exposed or suspected of being

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- (1) exposed to some toxic agents
 (2) Q Now how do these toxic end points occur?
 (3) A I m sorry?
 (4) Q What is the process by which the oil leads to these toxic end points?
 (5) A Well I have to speak in broad generalities because the mechanisms vary with each of the types of response but generally the organism must be exposed to some component or components of the oil and these must then enter the animal s body and interact in some way either with the structure or function with this animal to produce these effects
 (12) Q Now in addition to the toxic end points set out in Exhibit 465 are there other toxic responses below which any of these sorts of responses may occur?
 (15) A Well there is an additional toxic response that s known as geneotoxic response or toxicity to the genetic components of an organism
 (18) Q With reference to 466 can you explain geneotoxicity?
 (19) A As it states geneotoxicity is directed towards the hereditary components of the living species I might add that in the way of definition geneotoxicity is generally accepted to occur at concentrations below which all of these previous concentrations of toxicity - below which all of those previous end points are observed so this can occur in the absence of those end points

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- (1) Q Sir can you explain to us what causes geneotoxicity and again this is with reference to Plaintiffs 467?
 (3) A Again in generalities geneotoxicity results from the interaction of chemical or physical agents with the genetic components or the DNA of the living organism and thereby altering it so that it is no longer in the same form that it was originally And if we can put this in terms that are possibly understandable it alters the genes or those components of the genetic material that term heredity of the next cell or the next generation
 (11) Q Now is the concept of mutation used in this area?
 (12) A Mutations are one form of geneotoxicity
 (13) Q Have you prepared a chart to explain that to the ladies and gentlemen of the jury?
 (15) A I believe I have
 (16) Q Is 468 that chart sir?
 (17) A Yes that s correct
 (18) Q What are the consequences then, of mutations?
 (19) A Mutations can occur in two types of cells in the living organism one is the somatic cell and the other is the germ cell In the way of a brief explanation somatic cells are those cells of our body that will make up skin and liver and spleen and muscle all of these components The germ cells are the cells that produce gametes that is ovaries and sperm and eggs

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- (1) Now the same types of mutation of genetic alterations can occur in both types of cells it just depends on which cell is exposed to the toxic agents Somatic mutations are mutations that occur in the somatic cells generally result in neoplasm or cancer in the cell doesn t die first and terata or birth defects again if the developing embryo doesn t die first
 (7) Now these birth defects are not transmitted from the parent or embryo or offspring They are direct effects on the developing embryo by chemical or physical agents independent of the female s exposure Now the germ cell mutations result in recessive mutations that is recessions or mutation in the cell that we can t see they don t express themselves
 (13) Can I give an example?
 (14) Q Sure
 (15) A A couple of examples that are probably recognizable by most people would be - albinism is one A parent can be carrying an albino gene and transmit this and as long as the other parent doesn t transmit the gene the offspring is normal But if they both transmit albino genes and the offspring receives this combination they are born without pigment
 (21) Sickle cell anemia is another form of recessive gene in which some individuals may carry this recessive gene and show no signs of disease where if they got both of the genes then they suffer severe problems with the blood cell destruction
 (25) So that s what a recessive gene is It may not express itself

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- (1) until it s donated to the offspring by both parents
 (2) In addition to that the germ cell may produce a lethal mutation that is if the offspring or embryo receives this abnormal gene or chromosome it can ultimately die It may die very early in gestation or it may die after birth or some suffer some type of physiological or biochemical modification that causes it to die some time later in its life
 (8) Q Now Dr Kocan is there a way to try to determine whether or not these mutations exist before they manifest themselves in the sorts of gross ways that you ve talked about?
 (11) A Yes There are a number of tests that have been developed for trying to screen for mutations or chromosome damage and they range all the way from fairly gross methods of visually looking at the damage to measuring actual mutations And I believe here in this next chart -
 (16) Q Which is 469 Please go ahead and use that if it helps?
 (17) A I hope you all can read these Here I ve got the mutations broken into two categories micro and macro lesions meaning large and small The small ones are so small you can t see them You have to test for them indirectly and they are actually chemical modifications of the DNA molecule that result in a mutation that s inherited in the next cell
 (23) Q See if that helps at all
 (24) A Macro lesions in the upper right of the screen can consist either of numerical changes in the number of

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- (1) chromosomes or structural changes Now we all have a specific
- (2) number of chromosomes in every one of our cells and if we are
- (3) exposed to the proper types of agents we can develop a
- (4) situation where we have either too many or too few
- (5) chromosomes If there is too few generally the cell or
- (6) organism dies If there is too many generally there is some
- (7) sort of functional or structural problem
- (8) Structural changes in the chromosomes now is where the
- (9) chromosomes is actually broken or rearranged or damaged in some
- (10) way And you can see this under the microscope this
- (11) right hand column You can stain the cells look at the
- (12) chromosomes with a special technique and photograph them You
- (13) can see this type of damage and this is the type of damage
- (14) that's much easier to detect although it can be related to the
- (15) micro lesions, which are a bit more difficult to see because it
- (16) requires actually looking for the mutation as it develops in
- (17) the surviving cells
- (18) Q Sir with respect to these recessive characteristics have
- (19) you prepared an exhibit to help explain that as well?
- (20) A Yes I have
- (21) Q Try and get that up hopefully it will be a little bit more
- (22) colorful than the preceding group Let me see if I blow this
- (23) up just a little bit
- (24) A Could we just sort of -
- (25) Q Take just the top

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- (1) A Before we change this I'd like to just progress from the
- (2) top to the bottom of this scheme here and show here how a
- (3) recessive mutation in a single individual could be amplified
- (4) within a population even after no more mutations or no more
- (5) exposures to the cause as an active agent occurs
- (6) So if we start with the top we can see it better and then
- (7) we'll move down
- (8) Q All right.
- (9) A Okay These are color coded Unfortunately as we go down
- (10) the list the colors change a little bit and might be
- (11) confusing but if you look for pluses and minuses - here we
- (12) go There you see two minuses and in the left hand box you
- (13) see a plus/minus Throughout this presentation just bear in
- (14) mind that the plus means the presence of an abnormal or
- (15) mutant
- (16) gene and we're going to track how this mutant gene can be
- (17) passed on to subsequent generations
- (18) Now these two boxes at the top represent a male on the
- (19) left female on the right and they produce four offspring and
- (20) this is a number that's chosen because the introduction of
- (21) these genes falls in kind of groups of four
- (22) You see that as you cross the male and the female one of
- (23) these pluses or minuses is derived from each partner and it
- (24) goes into each offspring And here on the left you see that
- (25) this offspring has received a plus from this parent and a minus
- (26) from that parent The second green oval has received two

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- (1) minuses one minus unaffected gene from each parent
- (2) This blue oval has received an unaffected gene from the
- (3) carrier parent - I mean the affected gene from the carrier
- (4) parent and an unaffected gene from the non-carrier Sorry
- (5) about that.
- (6) And here on the right hand side this square represents a
- (7) perfectly normal individual that's inherited neither of these
- (8) So we have two carrier offspring and two normal offspring being
- (9) produced by a set of parents and one parent carries one
- (10) recessive gene
- (11) We can go to the next one Now let's say this is not a
- (12) human population
- (13) Q Would you have me blow up the middle section?
- (14) A Can you all read the middle section? They would like that
- (15) blown up
- (16) Q I'll get that.
- (17) A This doesn't normally happen in human populations where
- (18) brothers and sisters mate with each other but - not that it's
- (19) unheard of but in animal populations there is a lot of
- (20) animals all in the same area at the same time They don't know
- (21) who their brothers and sisters are so it's possible that a
- (22) brother/sister pair could mate That's not a contention I'm
- (23) making here
- (24) But for purposes of demonstration let's say the brother
- (25) and sister are here You see each carry a plus and a minus

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- (1) derived from that - from across - from the parents where one
- (2) was a carrier Now if a plus/minus plus/minus both of them
- (3) are carriers here, both of these are carriers (indicating)
- (4) Now when these cross just to simplify since you know what
- (5) the drill is now they will produce one offspring that carries
- (6) both recessive genes like the albino who has two recessive
- (7) albino genes We now have two carriers and we have one
- (8) normal
- (9) individual So we've increased from that population of one
- (10) carrier We've now got two more carriers and a fully affected
- (11) individual
- (12) Could I have the next one? And in this next one we're
- (13) going to cross a fully affected individual with a carrier I
- (14) see you're changing the mode here
- (15) Q All right sir
- (16) A Now same drill We have here a male that's a carrier and
- (17) a female that's a fully affected individual Colors are
- (18) changed but you see we have an affected cross with a carrier
- (19) and these then produce a fully affected individual a second
- (20) fully affected individual and two carriers All of the
- (21) offspring now are affected either as carriers or fully affected
- (22) individuals and we started with just a single mutation in the
- (23) population
- (24) Q All right
- (25) A This is also done I have to emphasize in the absence of
- (26) any further exposure to any genotoxic agents

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- (1) Q Now we're going to be building on this understanding in
 (2) just a little bit but let me ask you whether the petroleum
 (3) components you've described and explained to us some of the
 (4) potential difficulties for the fish whether they - when they
 (5) enter the ecosystem do they have any toxic effects on the
 (6) species on which the fish rely on for food as well?
 (7) A The individual chemicals and the combinations of chemicals
 (8) have been found to affect virtually all organisms the same
 (9) There are some quantitative or qualitative differences but
 (10) these substances are generally toxic to one degree or another
 (11) for most living organisms
 (12) Q And is the mode of developing the problems much the same
 (13) for the species on which the fish rely -
 (14) A Yes it is
 (15) Q Now were you called upon by the Exxon Valdez Trustees to
 (16) do some research in this area following the spill and relying
 (17) on the experience that you had?
 (18) A Yes I was
 (19) Q And were you called upon to do studies on the effects of
 (20) the Exxon Valdez oil on developing eggs and larvae of herring?
 (21) A Yes
 (22) Q What were you asked to do Dr Kocan?
 (23) A My I guess general assignment was to determine the
 (24) effects if any, of Exxon Valdez crude on developing herring
 (25) embryos and the larvae that subsequently developed from
 them

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- (1) and to relate this to any types of toxic abnormalities or
 (2) problems that were observed in Prince William Sound following
 (3) the spill
 (4) Q Did you develop a series of questions to answer as a part
 (5) of your work?
 (6) A Yes I developed an overview of how the studies should
 (7) progress in order to come to the - to try to come to
 (8) conclusions that I was working toward
 (9) Q All right sir And using what we've marked as Exhibit
 (10) 476 can you explain the questions that you set out to address?
 (11) A Yes These three questions consist of first does the
 (12) Exxon Valdez oil have an effect on Prince William Sound
 (13) herring? Obviously if the answer is no that's the end of the
 (14) study and the project. If the answer is yes then a second
 (15) question must be addressed and that question is what do
 (16) these effects look like You had to then describe these effects so
 (17) that we could define them specifically and know how to tell -
 (18) how to identify them in regard to exposure to the oil
 (19) And then third and I think it's a very important component
 (20) of this is to relate it or relate those types of injuries or
 (21) those types of effects to what was actually seen in Prince
 (22) William Sound in herring following the Exxon Valdez spill
 (23) Q Now Dr Kocan how did you go about answering question
 (24) number one?
 (25) A The first question was addressed by exposing developing

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- (1) embryos herring embryos obtained from herring in Prince
 (2) William Sound to Exxon Valdez crude oil which has been taken
 (3) off of the Exxon Valdez tanker at the time of the spill These
 (4) were embryos that I had spawned artificially spawned in the
 (5) laboratory from Prince William Sound herring and then reared
 (6) completely in the laboratory under artificial conditions And
 (7) the variable that I was looking at there was the presence or
 (8) absence and the concentration of Valdez crude oil
 (9) Q Let me just show you what's been marked 483 Can you
 (10) explain what this is sir?
 (11) A Yes This is a piece of laboratory apparatus known as a
 (12) separatory funnel Basically it's a glass bottle that's wide at
 (13) the top and narrow at the bottom has a stopper hole where
 (14) materials can be poured in and it's a stopper And at the
 (15) bottom there is a gadget called a stop cock or basically just
 (16) a valve that you can open and drain off the material at the
 (17) bottom And this was used to prepare all the contaminated
 (18) solutions that I used to expose the herring embryos
 (19) Q Let's begin to look at the findings from your research in
 (20) the lab And do you have a series of slides that show the
 (21) ladies and gentlemen of the jury what you found?
 (22) A Yes
 (23) Q Let me call up the first of those sir
 (24) A Following exposure to a range of concentrations of
 (25) hydrocarbons ranging from zero to about ten parts per million

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- (1) I believe I observed the development of the embryos until they
 (2) hatched and then I collected the newly hatched larvae and
 (3) analyzed these larvae for a variety of deformities or whatever
 (4) differences there were relating to the exposed and unexposed
 (5) and the various concentrations
 (6) And the first observation I made first was that the oil
 (7) killed virtually none of the developing embryos They made it
 (8) all the way to hatching regardless whether they were exposed
 (9) or not and in the same numbers in all of the exposure groups
 (10) but at the time of hatching I began to notice a subtle
 (11) difference And in the top panel of this graph you'll
 (12) notice -
 (13) Q Would it be helpful to blow that up?
 (14) A I think it probably would be better - this is for - you
 (15) don't need to know the numbers I can tell you what they are
 (16) On the top graph that represents the number of individuals
 (17) that hatched each day over a period of time following
 (18) fertilization and the horizontal axis or the axis that runs
 (19) this way is the dependant variable that is the number of
 (20) days And the vertical axis or the ones that run upright
 (21) tells you the individuals that hatched each day
 (22) So if you look at a particular day you can see how many
 (23) individuals hatched And the two lines mean that there were
 (24) two groups of fishes that were - or embryos that were used in
 (25) this experiment And basically what that says is that in 19 to

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- (1) 20 days following the fertilization the majority of the
 (2) embryos hatched and they hatched alive When I say hatch I
 (3) mean alive they weren't dead and fell out of the egg
 (4) Now in the second panel in the middle those represent
 (5) three of the lowest concentrations of hydrocarbons that were
 (6) present in the exposures that I did and you see there that
 (7) there is a little bit of variability in the days that some of
 (8) the groups hatched There is three groups here represented in
 (9) this middle panel but again about 19 days you see that the
 (10) majority of the embryos hatched
 (11) In the bottom panel however you see at the higher
 (12) concentrations that hatching was premature instead of
 (13) hatching on day 19 they hatched around beginning day 14 and
 (14) were virtually finished by day 15 16 So the trend here is
 (15) that exposure to increasing concentrations of oil or an oil
 (16) component causes premature hatching to occur in herring
 (17) embryos and this is something that's been observed in a
 number
 (18) of different species and a number of different laboratories for
 (19) petroleum hydrocarbons
 (20) Q Now in your research did you also look at the larvae
 (21) themselves sir?
 (22) A Yes We examined - following this hatching the larvae
 (23) were collected on the day that they hatched each day Then
 (24) they were taken out and they were preserved and these were
 (25) then examined for their relative I say normalness were there

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- (1) any birth defects present or abnormalities
 (2) This slide represents just three normal herring embryos
 (3) It's presented just so you get a feeling for what they look
 (4) like
 (5) The middle embryo has a small defect which we'll get into
 (6) a little later but basically the impression is that they are
 (7) separate their heads are separate their eyes are where they
 (8) belong Not an awful lot wrong with them They would be
 (9) considered for impression purposes normal embryos This
 (10) wasn't the Exxon Valdez study, but it was a petroleum related
 (11) study
 (12) The embryos that were exposed to petroleum hydrocarbons
 (13) looked like the following slide Now again for impression
 (14) purposes it's obvious they were not normal they are deformed
 (15) bent spines eyes are not right These are organisms that are
 (16) not likely to survive Well these are organisms that are not
 (17) going to survive no question about that
 (18) Q Now do we have some pictures from your own larvae from
 (19) your own study with respect to the Exxon Valdez?
 (20) A Yes we do
 (21) Q Let me pull up 481
 (22) A Okay Here are represented three larvae The anterior or
 (23) middle of the body toward the head were exposed in my
 (24) laboratory to Exxon Valdez crude
 (25) The center larvae that's a normal individual the jaws are

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- (1) normal the eyes are where they belong The yolk sac which is
 (2) this little gadget right here and carries all the nutrients
 (3) this little fish will live off of for about the first ten days
 (4) to two weeks of its life It's normal all the muscle
 (5) structure in the body you can see all the segments appear
 (6) normal
 (7) Now at the very top of the screen you see the yolk sac is
 (8) very much smaller the yolk is smaller there is a lot of space
 (9) in that sac And in the bottom one the pericardial region
 (10) that means the region around the heart just below that second
 (11) dot is filled with fluid and this is a condition called
 (12) pericardial edema or fluid filled sac around the heart.
 (13) These are some conditions I found in the larvae that I
 (14) worked with Go ahead
 (15) Q Let me show you the next one you asked me to have
 (16) available 479
 (17) A This is a close up to give you a better view of the head
 (18) and how the development occurs The larvae at the top is a
 (19) newly hatched normal larvae Its jaws are developed in such a
 (20) way that they will meet each other when they close The spine
 (21) is straight, the yolk sac is relatively normal no problems
 (22) The larvae to the left you see the upper jaw is mostly
 (23) missing because the eye is hanging or protruding below the
 (24) level of where the upper jaw should be and the entire jaw
 (25) line as you can see extends clear back behind the eye which

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- (1) is abnormal if you compare it to the fish on the right-hand
 (2) side And just behind the head there is a kink in the spine
 (3) Subtle differences but still differences that are going to
 (4) affect the survival of these individuals
 (5) Q Call up the next one you asked that I show you sir
 (6) A This individual goes without explanation I think it's
 (7) fairly obvious there is no way this individual is going to
 (8) hatch
 (9) Now in the higher concentrations that I used in the
 (10) laboratory studies 100 percent of the larvae that hatched were
 (11) this type of configuration They were just totally deformed
 (12) and totally incapable of survival on their own
 (13) Q Next I have 480
 (14) A This is again another individual You see the yolk sac is
 (15) very small The yolk sac there is much smaller than it should
 (16) be The tail is obviously deformed and the upper jaw is
 (17) truncated that is it has grown out as far as it should so it
 (18) properly meets with the lower jaw And the gill region just
 (19) behind the lower jaw is obviously swollen and deformed it
 (20) would be right there the entire body structure of this animal
 (21) is not right as you saw in the picture
 (22) Q Let me show you 485
 (23) A This shows herring larva that obviously has a bent spine
 (24) the yolk is fairly normal proper sides and location There is
 (25) no problems anterior to the yolk sac but the eyes are

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- (1) protruding from the side of the head and the lenses are
 (2) protruding from the eyeballs Obviously there is a gross
 (3) deformity and no chance of survival
 (4) Q Next one
 (5) A This fella is upside down it has no lower jaw and you can
 (6) see there is no lower portion to the face which would be
 (7) facing up in this case That's where the lower jaw should be
 (8) The top of the head is here where that unusual bump is and
 (9) the eyes are hanging down into what would be the roof of the
 (10) mouth
 (11) Q Finally 487 sir
 (12) A This one has a grossly deformed spine and it has no facial
 (13) features no mouth no eyes no ears They have overlaid ear
 (14) bones not capable of surviving on its own
 (15) Q Now sir in your research was there a relationship in the
 (16) sorts of deformities which we've seen and the concentration of
 (17) Exxon Valdez oil to which the eggs were exposed?
 (18) A Yes there was a relationship between the two
 (19) Q Did you prepare a chart to explain that?
 (20) A Yes I did
 (21) Q Let's look at 511 Please go ahead and explain
 (22) A This chart represents the number or the percent of normal
 (23) larvae that hatched at each of the concentrations to which I
 (24) exposed them Now the concentrations are listed on the
 (25) bottom
 (25) in parts per million You'll hear that term come up many times

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- (1) during this trial And on the left the concentration is zero
 (2) That would be the control And as we move to the right the
 (3) concentrations increase until at the far right they reach 9 67
 (4) or for purposes of discussion we'll just say ten parts per
 (5) million
 (6) And you can see when the concentration exceeds 9 or less
 (7) than one part per million that there are no normal larvae
 (8) Now this is - I need to back up a little bit here and explain
 (9) it to you These concentrations represent only dissolved
 (10) hydrocarbons Remember yesterday we discussed the
 (11) dissolved
 (12) and the droplet types of mixtures with the water? There is no
 (13) whole oil in these This is purely dissolved hydrocarbons and
 (14) these measurements are made just on the diesel range The
 (15) gasoline range hydrocarbons are very volatile and when you
 (16) put
 (17) them into the container where the embryos are they very
 (18) quickly evaporate In less than 24 hours most of them are
 (19) gone The most stable component is the diesel range
 (20) So in my experiments you wouldn't see all the details I
 (21) measured the concentrations of gasoline and the
 (22) concentrations
 (23) of diesel and I know what they are but I present them here in
 (24) diesel range just for purposes of stability because it would be
 (25) constant all the way along If the others are needed they can
 (26) be calculated So these are diesel range hydrocarbons and it
 (27) represents what's dissolved in the artificial seawater
 (28) Now what scientists usually do when they are doing

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- (1) toxicological studies look for LD 50 which is - because
 (2) statistically it's the easiest number to play with least
 (3) variability That means the lethal dose or in some cases the
 (4) effective dose In this case they didn't die so it's 50/50
 (5) percent of the individuals are affected and 50 percent are
 (6) not
 (7) And in this particular study without going into more
 (8) elaborate details the LD-50 is approximately slightly less
 (9) than a half of a part per million right there Okay? And the
 (10) reason I say that that's the concentration because you'll see
 (11) that there are only even in the controls about 60 percent of
 (12) the larvae that hatch are normal This is not unusual
 (13) In any situation where there are huge numbers of offspring
 (14) produced many of them will not be normal many will not
 (15) live but you need to compare the unexposed to the exposed
 (16) here
 (17) in order to see differences between them
 (18) So you see here where - at the control concentration of
 (19) zero there are approximately 60 percent normal larvae and at
 (20) the 48 concentration there are approximately 30 percent
 (21) larvae And when this is worked out mathematically it comes
 (22) out to be the effective concentration 50 percent
 (23) Q Sir do the concentrations that you chose to use in the lab
 (24) reflect the sorts of concentrations one might expect to have
 (25) found in the areas where herring were spawning in Prince
 (26) William Sound in 1989?

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- (1) MR COOPER Objection Your Honor I haven't heard
 (2) any foundation Your Honor to establish the witness as having
 (3) any expertise or having done any work in the field of
 (4) concentrations
 (5) MR JAMIN In the foundation - Your Honor I can get
 (6) into it some more but he was in the field in '91 and '92 I
 (7) think we brought that out
 (8) MR COOPER The key point -
 (9) THE COURT I'm sorry I'm one step behind you
 (10) Either ask the question again or read it back one way or the
 (11) other
 (12) MR JAMIN Let me ask you to read it back
 (13) (Record read)
 (14) THE COURT I'll sustain the objection without some
 (15) more foundation
 (16) MR JAMIN I'll develop more foundation
 (17) BY MR JAMIN
 (18) Q In connection with the research you did in the lab and the
 (19) research you did in the field did you become aware of the
 (20) concentrations of oil in the environment where the herring
 (21) spawned?
 (22) A I was aware of the concentrations based on the studies done
 (23) by other individuals
 (24) Q Were those other individuals part of the Trustee process?
 (25) A Yes some of them were and some of them were Exxon's

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- (1) scientists
 (2) MR JAMIN May I go ahead Your Honor?
 (3) THE COURT I think so
 (4) BY MR JAMIN
 (5) Q Sir do the concentrations that you chose to use in the lab
 (6) reflect the sorts of concentrations that might have been found
 (7) in the areas where herring spawned were deposited in 1989?
 (8) A The concentrations that occur in the field situation
 (9) following an oil spill are quite variable and they range from
 (10) pure oil to no oil so - and they also depend on how much
 (11) mixing has occurred and how recently after the spill it has
 (12) occurred and a number of factors It's possible that these
 (13) concentrations were present in the field in oiled locations
 (14) following the spill but a direct comparison between the field
 (15) and the laboratory is not really possible because you can't
 (16) exactly replicate all the conditions that occur in the field in
 (17) a laboratory situation
 (18) The experiment was designed to demonstrate that in the
 (19) presence of oil there was an adverse effect on these embryos
 (20) Q Let's go right on to the field then Was there research
 (21) done in the field which reflects the effects of the oil on the
 (22) herring and which overlaps what you did in the lab?
 (23) A Yes There were field studies conducted from 1989 through
 (24) 1992 in the field in Prince William Sound
 (25) Q Did you participate in some of those?

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- (1) A I participated in studies from 1991 and 1992 but had
 (2) access to the data that had been developed prior to that time
 (3) Q Can you explain to us what the mode of research was in the
 (4) field?
 (5) A The field studies involved - in 1989 they involved the
 (6) collection of herring embryos from sites that had been oiled
 (7) and from sites that had not been oiled and these embryos were
 (8) brought to the laboratory and in the laboratory they were
 (9) incubated in seawater and allowed to hatch And then the same
 (10) types of abnormalities - or the same types of observations
 (11) were made to determine whether or not there were
 (12) abnormalities
 (13) or mortalities occurring in these larvae that had hatched from
 (14) oil or - on the oiled or presumably unoiled embryos
 (15) Q Let's look at 514 Does that reflect some of the evidence
 (16) from the field sir?
 (17) A Yes This graph represents three years of field data
 (18) collected by other members of the Trustee team working just
 (19) prior to and up to the time I became involved in the study
 (20) and - that's what they represent
 (21) Q What does - does it show certain areas that were oiled and
 (22) certain areas that were not oiled?
 (23) A Yes it does There are three bars represented for each
 (24) year If you see along the bottom of the years 1989 90
 (25) 1991 are represented The blue bar or the bar on the left for
 each of these years is from Fairmount Bay It's in the north

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- (1) end of the Sound and was reported to have been not directly hit
 (2) by the oil plume That's Fairmount Bay
 (3) Now the other two bars represent Rocky Bay which is on
 (4) the north end of Montague Island and is a herring spawning
 area
 (5) and was reported variably to be oiled or lightly oiled by
 (6) different investigators And the third bar represents Naked
 (7) Island which was completely surrounded by the trajectory of
 (8) the spill in 1989 and was also a spawning area for herring at
 (9) that time
 (10) And what this graph shows for 1989 is that the two oiled
 (11) areas the two bars on the right produced significantly more
 (12) physical embryos with more physical deformities than did the
 (13) site that had embryos from the unoiled site So embryos from
 (14) an unoiled site had more normal and less abnormal larvae than
 (15) did the embryos that were collected from the two oiled sites
 (16) Now in 1990 all of the physical deformities or physical
 (17) deformities in all of the sites was very dramatically reduced
 (18) the year following the spill But again if you look at 1990
 (19) you'll see the same trend and that is that the Fairmount Bay
 (20) or the blue bar represents the very smallest number of
 (21) abnormal larvae and the two oiled sites or the two bars on
 (22) the right represent larger numbers And in this case the
 (23) difference is - I'd say it's about a hundred percent doubling
 (24) or a hundred percent increase between Fairmount Bay and
 Naked
 (25) Island

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- (1) Here in 1991 there didn't seem to be any effects that were
 (2) significant between the one oiled site and - or the unoiled
 (3) site and Rocky Bay and there was no spawn collected at all
 (4) from Naked Island They didn't spawn there so they couldn't
 (5) be compared
 (6) So basically what we see for each site during - comparing
 (7) 1989 and 1990 there is overall fewer deformed larvae in 1990
 (8) but in both years the oiled sites produced more abnormal larvae
 (9) than the unoiled sites
 (10) Q Now sir the initial figure for the unoiled area about 70
 (11) percent if I recall is somewhat higher than the results from
 (12) the lab where there was no oil where it was about 50 percent
 (13) or so Can you explain how even for an unoiled area or why
 (14) we're seeing a higher rate than you saw in the lab that 70 as
 (15) opposed to 50?
 (16) A Well could you repeat the question?
 (17) Q All right As I understand it from your laboratory work
 (18) we might expect abnormalities in the range of 50 percent when
 (19) there is no oil and in this area we have 70 percent and it's
 (20) from an area where there was no direct exposure to oiling
 (21) Were there any other factors sir which might have been
 (22) present to explain the difference between the 70 percent and
 (23) the 50 percent we saw in the lab?
 (24) A Well the end points you're looking at here is just the
 (25) abnormalities that are present in the larvae that resulted from

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- (1) these eggs However being that it s a complex field
 (2) situation we have no way of tracking all of the history that
 (3) proceeded the deposition of these eggs and the ultimate
 (4) incubation and hatching which means that the adult fish
 coming
 (5) into Prince William Sound in 1989 were swimming through the
 (6) oiled plume when they were entering the spawning grounds
 They
 (7) were also exposed to contaminated food items on their way to
 (8) the spawning grounds as there was oil in the Sound in various
 (9) locations in Prince William Sound
 (10) So my opinion is that in 1989 there was a generalized
 (11) exposure of most components - most of the ecosystem in
 Prince
 (12) William Sound and that these elevated levels relative to the
 (13) subsequent years are due to an overall contamination of the
 (14) Sound
 (15) Q So are you saying that even before the eggs are released
 (16) into the environment that there was some exposure to the
 (17) herring as adults coming in?
 (18) A Yes As I understand it the adults began swimming into
 (19) Prince William Sound throughout the southwest Montague
 channel
 (20) during late March and early April which coincides with the
 (21) time that the oil spill occurred And based on trajectory maps
 (22) and actual measurements of hydrocarbons in the water and in
 the
 (23) mussels that were on the bottom the sea bottom that they
 swam
 (24) through the trajectory coming in and that several of the groups
 (25) spawned within the oiled areas

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- (1) Q How would the oil affect the female coming in with her
 (2) eggs sir?
 (3) A Well when an organism is exposed to hydrocarbons the
 (4) route of entry can be by several means natural means One
 (5) the hydrocarbons are taken up directly through the skin or
 (6) gills and enter the body and dissolve into lipid materials
 (7) And even if we are lean and mean brain tissue even has a lot
 (8) of lipids - there is a lot of lipids in our body
 (9) They can also eat contaminated prey in which the
 (10) hydrocarbons are absorbed into the blood stream through the
 (11) intestinal tract and dissolved into lipids and gotten into the
 (12) body
 (13) One mechanism that animals have to get rid of toxic is to
 (14) get rid of that part of body that contains most of the toxins
 (15) In shellfish - they contain high amounts of metals When they
 (16) molt their shell there is high concentrations of metals
 (17) in their shells When they molt the shells they get rid of a
 (18) heavy burden of the toxins that are in the shell
 (19) Organisms that lay eggs that is there is a lot of fat in
 (20) the yolk the lipid solubles or fat solubles are deposited into
 (21) the lipid depos of the yolk and they rid their body of all of
 (22) these - or a high proportion of these contaminants by
 (23) releasing the eggs
 (24) Granted this is potentially sacrificing the offspring but
 (25) it s allowing the individual female to go on and spawn at a

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- (1) later time
 (2) Q Let s go back to the lab for a moment and could you
 (3) compare controlled larvae weights to exposed larvae weights?
 (4) A Yeah This graph represents the weight of the larvae at
 (5) the time they hatched I use weights because as you can see
 (6) from the - we saw on the previous pictures it would be
 (7) difficult to measure some of these And I saw that the actual
 (8) biomass the amount of tissue that s there is more
 (9) significant Where they re long and skinny or short and
 (10) skinny these tend to be variable but biomass and weight I
 (11) find more reliable
 (12) So I weighed them got the dry weight immediately after
 (13) they hatched and what I found was in the left hand bar you
 (14) see the weight of the larvae that were not exposed to oil is
 (15) over double or about double that of the weight of the
 (16) individuals that were exposed to oil
 (17) And interestingly enough it doesn t matter what
 (18) concentration if they are exposed to oil their weights were
 (19) lower And these are just the normal larvae These are the
 (20) ones that did not appear to be abnormal These are the ones
 (21) that appeared to be perfectly normal straight no spinal
 (22) defects No spinal defects no jaw defects The normal life
 (23) individuals exposed to oil were considerably significantly
 (24) smaller at birth than the unexposed embryos
 (25) Q Does weight affect survival in herring?

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- (1) A Yes Weight and age seems to be a good indicator of
 (2) survival and that these individuals have to compete with other
 (3) individuals on the same age and when they are smaller they
 (4) are more prone to predation because they can t escape as well
 (5) They can t compete for food as well with the larger
 (6) individuals and in general their potential for survival is
 (7) reduced
 (8) Q Did the Trustees look at larval size in the field as well?
 (9) A Yes There were two separate studies in the field that
 (10) dealt with larval size
 (11) Q Let me call up -
 (12) A Larval weight
 (13) Q I m sorry?
 (14) A Larval weight.
 (15) Q Let me call up 497 The previous exhibit was 496 Go
 (16) ahead sir
 (17) A This graph is data that I generated from larvae that I had
 (18) exposed in the field at oiled and unoiled sites as embryos I
 (19) had explained to you earlier that I artificially spawned these
 (20) fish and collected their eggs and I developed a small cassette
 (21) made of PVC pipe that I put in the water at different locations
 (22) and put the embryos there and let them incubate and bring
 them
 (23) back in the laboratory and allow them to hatch and I observed
 (24) them
 (25) Now this is 1991 two years after the spill I exposed

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(1) embryos at several oiled sites and several unoiled sites and
 (2) retrieved them for the laboratory and one of the findings that
 (3) I had found again those individuals that incubated at unoiled
 (4) sites or sites that had not been oiled in 1989 were
 (5) significantly larger than those that were incubated at sites
 (6) that had been oiled in 1989
 (7) Now I don't have a figure to show this but another study
 (8) was performed by other members of the Trustee team prior to
 my
 (9) coming on the scene in 1989 and they found that the weights of
 (10) larvae that came from oiled sites in 1989 were also
 (11) significantly smaller than the weights of larvae that had been
 (12) collected or incubated at - naturally spawned I should say
 (13) at unoiled sites So in 1989 there was a difference between
 (14) oiled and unoiled sites the oil having significantly smaller
 (15) larvae
 (16) In 1991 there was a difference between the two sites This
 (17) was under experimental conditions where I controlled
 (18) everything except the location and the history of the site and
 (19) in the laboratory exposure to oil verified that the exposed
 (20) individuals would be lighter
 (21) Q Having dealt with deformities and larval size let's go
 (22) back to the lab for a moment where your next findings there
 (23) related to chromosome damage and I'm going to call up 499
 (24) A Yes This represents a group of figures based on exposure
 (25) rates similar to those that I used in the original slide of

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(1) data that I showed you where there were physical deformities
 (2) I simplified this a bit by not putting in every single data
 (3) point but I gave you - on the left the blue bar is zero or
 (4) no exposure controls On the far right 24 micrograms or
 (5) parts per million Now that represents one-half of the EC 50
 (6) we described
 (7) If you remember the original graph we showed at that
 (8) concentration you cannot detect the difference in physical
 (9) deformity So what I'm saying when we looked at physical
 (10) deformities these concentrations showed no difference in the
 (11) number of physical deformities but when we looked at the
 same
 (12) individual chromosomes we found a significant increase in the
 (13) number of damaged chromosomes The concentration of oil
 (14) increased until we got up to about 27 percent abnormal
 (15) chromosomes in just a quarter of a part per million
 (16) Q Now were similar analyses done from field herring?
 (17) A That's correct
 (18) Q Let me call up next 500 Does this demonstrate the range
 (19) for field herring?
 (20) A Here again we're dealing with oiled and unoiled sites and
 (21) the bar on the left again represents the control or unoiled
 (22) sites Fairmount Bay That's the control site And the two
 (23) bars on the right represent again Rocky Bay and Naked
 Island
 (24) two of the experimental previously oiled sites
 (25) And you can see that there is quite a significant increase

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(1) in the number of damaged chromosomes that were obtained
 from
 (2) larvae that had incubated at those two sites as embryos in
 (3) 1989 And this pattern is exactly the same you see as
 (4) concentrations increase under controlled laboratory conditions
 (5) Q Sir have you selected a couple of slides to show us what
 (6) the chromosome damage looked like that you were measuring?
 (7) A Yes
 (8) Q Look at 492 What does this represent sir?
 (9) A This is a normal fish cell that is undergoing mitosis
 (10) mitosis being cell division or the dividing of one cell into
 (11) two cells And what this shows is the outside of the cell the
 (12) cell wall out here and the chromosome bundles are these two
 (13) dark bands which are - chromosomes are like a bunch of
 (14) spaghetti they get all lined up So in the middle of a cell
 (15) and when it's time to divide they pull apart like this And
 (16) that's what's happening These bundles of chromosomes are
 (17) pulling apart and soon there will be a cell wall laid down
 (18) between the two groups and you will have two cells
 (19) Prior to this event occurring the number of chromosomes in
 (20) that cell doubled This is a normal process and then when the
 (21) cell divides in half each one gets a normal number of cells
 (22) So this is a normal process called anaphase or mitosis And
 (23) this particular stage is called anaphase and the test we used
 (24) to determine whether there was chromosome damage which is
 sort
 (25) of a broad spectrum shotgun approach to measuring as many
 as we

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(1) can is an anaphase aberration test
 (2) Q Next one is 493
 (3) A Now I think that big screen in the front shows it at least
 (4) better than I see it on this screen
 (5) Q Do you want me to blow it up?
 (6) A No that's fine If the jury can see this large screen
 (7) that's perfect.
 (8) This again is a fish cell that's been exposed to a single
 (9) component of petroleum hydrocarbons and that's a chemical
 (10) known as benzoid pyrene common laboratory term for
 (11) polyaromatic hydrocarbon extensive research
 (12) Now these were cells that were exposed to just this
 (13) chemical and I believe this was a tenth of a part per million
 (14) I believe It may have been more but a tenth of a part per
 (15) million concentration And what you can see here once again
 (16) the outline of the dividing cell but in this case if you look
 (17) closely between those two bundles here is one bundle there is
 (18) the other bundle you see bits and pieces and fragments of
 (19) chromosomes that are not where they belong You see
 bridges
 (20) Doesn't want to work But you see bridges where
 (21) chromosomes are stuck between the two poles and they don't
 want
 (22) to come apart You see whole chromosomes off on the side
 and
 (23) what's going to happen here now when this cell ultimately
 (24) finishes dividing and produces two - you can't even make the
 (25) cell divide When it divides the probability that each

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- (1) daughter cell receives the appropriate number of chromosomes
 (2) is
 (3) very unlikely because they are not where they belong So one
 (4) of them is going to receive too few and one of them is going to
 (5) receive too many and one of them will die and the other will
 (6) develop some sort of structural or functional defect
 (7) If this is in a somatic cell it could result in cell death
 (8) or necrosis or cancer ultimately If it's in a germ cell dead
 (9) germ cell dead sperm or egg or it could result in a defect in
 (10) the hereditary components the genes which are then passed
 (11) on
 (12) to the next individual that receives the gamete produced by
 (13) that cell
 (14) Q Let's go back to the lab for a moment and did you look at
 (15) cytogenetic damage in the lab?
 (16) A Yes we did
 (17) Q What is that sir?
 (18) A Cytogenetic really means damage, visible damage to -
 (19) damage to the visible components of the cell visible genetic
 (20) components of the cell
 (21) Q Did you find in the lab a relation between the amount of
 (22) oil exposure and the amount of cytogenetic damage?
 (23) A Yes Under the laboratory conditions as oil exposure
 (24) increased so did the frequency of cytogenetic damage
 (25) Q Was the phenomena looked at in the field?
 (26) A Yes That was looked at in the field just as was the
 (27) abnormalities and the chromosome damage

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- (1) Q Were there similar findings in the field?
 (2) A Yes they were similar
 (3) Q Let's go back into the lab again for your next finding
 (4) Did you look at cell damage independent of chromosome
 (5) damage?
 (6) A Yes we did
 (7) Q What did you find?
 (8) A Cell damage here would be defined as dead cells cells with
 (9) abnormally shaped nuclei cells that had not completely
 (10) undergone cell division may have two nuclei instead of one a
 (11) number of things but basically what we found was that as
 (12) hydrocarbon concentration increased so did the cell damage
 (13) Q That was the lab finding?
 (14) A Yes
 (15) Q Was the phenomena looked at in the field?
 (16) A Yes
 (17) Q Did oiled sites show increased cell damage in the field?
 (18) A Yes they did
 (19) Q Let's go back to your field work for your next finding
 (20) Did you look at hatching success as an indicator of damage?
 (21) A Yes I did
 (22) Q In what year did you study that sir?
 (23) A In 1992 we designed and began studies on reproductive
 (24) success for various - for herring in Prince William Sound and
 (25) we based that on production and successful hatching of viable
 (26) eggs

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- (1) Q What did you find?
 (2) A On the basis of that study we found that those female
 (3) herring that were collected from oiled sites produced fewer
 (4) live larvae at hatching then did the females collected from
 (5) unoiled sites I don't know if I got that backwards
 (6) Q You can say it again and clear it up
 (7) A In case I got it wrong fewer of the eggs hatched from the
 (8) females that were collected from oiled sites than from females
 (9) that were collected at unoiled sites The unoiled females were
 (10) more successful than those from the oiled sites
 (11) Q Now up until now sir we've shown some pictures of
 (12) herring from the lab I'll show you 503 and ask you to tell us
 (13) what that is
 (14) A These are three herring that were obtained from Prince
 (15) William Sound or were hatched from hatchery spawned eggs in
 (16) Prince William Sound in 1989 The top larvae is a newly
 (17) hatched normal larvae The larvae on the left and on the lower
 (18) right and lower left are both abnormal They have bent spines
 (19) eyes deformed snouts of a variety of different types of
 (20) damage These were collected - the larvae on the top was
 (21) derived from eggs that had been collected from an unoiled site
 (22) and the two at the bottom were collected from oiled sites
 (23) Q Let me show you next what's been marked 504
 (24) A This is again a similar representation There are three
 (25) larvae here with varying degrees of abnormalities again all

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- (1) collected from Prince William Sound and used to demonstrate
 (2) that the types of abnormalities that you've seen in the
 (3) laboratory are similar to those that we found in the Sound in
 (4) 1989
 (5) Q Now sir having made the comparisons that you did between
 (6) your laboratory work field work that you did and the field
 (7) work that others did do you have any conclusions to present to
 (8) the jury about the relation between Exxon Valdez crude oil and
 (9) herring following the spill?
 (10) A Yes
 (11) Q Have you collected those in 1994?
 (12) A Sure The conclusions that I came to following the studies
 (13) I did with Exxon Valdez oil were that if herring embryos are
 (14) exposed to crude oil in the laboratory that you can get, and
 (15) you do get premature hatching of the embryos of the larvae
 (16) You also get an increased number of abnormal larvae and this
 (17) is dependent on the concentration of oil that's present You
 (18) get lower weights in even the normal appearing larvae that had
 (19) been exposed to oil relative to those that had not been exposed
 (20) to oil and there is increased cytogenetic or heretical damage
 (21) in the exposed individuals compared to the unexposed
 (22) Q Do you also have a series of conclusions to share with us
 (23) from the work in the field?
 (24) A That's correct.
 (25) Q Call up 495

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- (1) A The field conclusions cover studies that were done by
 (2) myself and other individuals whose data I have had opportunity
 (3) to see and use And in 1989 the conclusions were that there
 (4) was increased embryo mortality Now this is based on studies
 (5) that were done by the Trustees prior to my becoming involved
 (6) There were increased abnormalities at oiled sites in the
 (7) larvae and there was an increase in the amount of genetic
 (8) damage in the larvae from oiled sites
 (9) In 1991 - I might put in here too an additional - that
 (10) the weights of larvae collected from oiled sites were also
 (11) lower in 1989 It s not represented up there but I described
 (12) that just a few minutes ago The weights were lower in 1989
 (13) In the study I did in 1991 where I put embryos in the
 (14) field and incubated them and brought them back again we saw
 (15) reduced birth weights at the oiled sites relative to unoiled
 (16) We saw increased numbers of abnormalities in those
 (17) individuals And in 1992 in the one study we did we saw that
 (18) there was a lower hatching rate in females that were collected
 (19) from oiled sites relative to those collected from the unoiled
 (20) sites
 (21) Q All right sir Now I want to apply some of these findings
 (22) to the various year classes that we talked about Do you have
 (23) an opinion as to the effect of the Exxon Valdez oil on the 89
 (24) herring year class?
 (25) A On just the 89?

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- (1) Q Just the 89 for now
 (2) A Yes My opinion is that that was probably the most
 (3) severely affected year class and that s based on the fact that
 (4) they were the youngest That s the most susceptible stage
 (5) The parents had an opportunity to become exposed prior to
 (6) laying the eggs and they had to rear - their nursery area was
 (7) Prince William Sound the spring and summer following the
 (8) hatching So at the time the majority of the oil was present
 (9) the 89 year class was at its most susceptible stage so
 (10) probably sustained most of the damage
 (11) Q When would that year class start coming back to the Sound
 (12) to spawn?
 (13) A As I explained yesterday normally you could expect to see
 (14) the first returns entering the spawning population but not yet
 (15) spawning as three year olds so that would have been in 1992
 (16) But my experience when we were collecting fish in 1992 was
 (17) that of thousands that we collected we found virtually no
 (18) three year olds at the time They were very few of them
 (19) returning
 (20) Q Would a larger percent of that 1989 year class be coming
 (21) back in 1993 and 1994?
 (22) A In 1993 a larger percentage would be expected to return
 (23) Normally and traditionally or historically one would expect an
 (24) average return of 60 percent or so of the total - four year
 (25) old population in 1993

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- (1) Q And a larger percentage in 94 then?
 (2) A Yes They would again increase in 94 when they were five
 (3) years old
 (4) Q Do you have an opinion sir as to whether the effect of
 (5) Exxon Valdez oil on the 1990 herring year class was
 (6) substantial?
 (7) A Well here again my opinion is based on the fact that
 (8) historically - well first the 19 - I m sorry would you
 (9) repeat that question I missed the year again
 (10) Q We ve talked about the 1989 year class Now I want to
 (11) focus on the 1990 herring year class Do you have an opinion
 (12) as to whether the effect of the Exxon Valdez oil on the 1990
 (13) year class was substantial?
 (14) A Well the 1990 year class of course would be the one -
 (15) the year following the spill and their exposure would be not
 (16) directly to oil that had been spilled in the previous year but
 (17) to the subsequent effects or any residual oil or resuspension
 (18) of oil that might be occurring the following year The damage
 (19) would be less extensive and possibly of different types than
 (20) occurred in 1989
 (21) Q Do you have an opinion as to whether there was an effect of
 (22) Exxon Valdez oil on the 1991 year class?
 (23) A 1991 year class? Again if we get further from the spill
 (24) the direct effects that is the effects that resulted in
 (25) direct contamination by oil would be less than would be -

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- (1) than they would have been if they were there and present
 during
 (2) the time of the actual spill
 (3) Q So the most severe effect from the spill focuses on this
 (4) 89 year class and that s the class that is returning for
 (5) spawning in 93 and 94?
 (6) A That s correct
 (7) Q Now were the opinions that you ve shared so far with the
 (8) jury today formed prior to your having been retained by
 (9) Plaintiffs in this case?
 (10) A Yes Those were based on data that was available at the
 (11) time were formed prior to being retained
 (12) Q And that was when you were with the Trustees?
 (13) A That s correct
 (14) Q Based upon the field work and lab work you and others had
 (15) done with herring did you form an opinion in 1992 that the
 (16) herring returning in 1993 would be more susceptible to disease
 (17) than normal because they were exposed to Exxon Valdez oil?
 (18) A Yes The conclusions of the synthesis committee that met
 (19) following the completion of all the studies was as I recall
 (20) I ll try to paraphrase it that all year classes that were
 (21) present in 1989 had been affected to some degree by exposure to
 (22) oil, and that all of them would very likely have been - have
 (23) suffered some form of damage to their immune system And I
 (24) believe we predicated an increase in disease frequency
 (25) following that

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- (1) Q And was your prediction realized sir?
- (2) A Well in 1993 there was appearance of large numbers of
- (3) lesions in Prince William Sound herring in the spawners and
- (4) these lesions at the time appeared to be related to the
- (5) presence of a virus known as VHS or viral hemorrhagic
- (6) septicemia
- (7) Q Let me break that down First what is a virus?
- (8) A It's a submicroscopic organism that invades or requires a
- (9) living cell for its own existence and it lives in and depends
- (10) on that cell for its reproduction Some viruses are not known
- (11) to cause any problems and others are known to be quite severe
- (12) pathogens
- (13) Q Can viruses have both a latent and an active stage?
- (14) A Yes This is very common in viruses Latent stage merely
- (15) means that it lives within the cell either not reproducing or
- (16) reproducing at such a low rate that its effects or presence is
- (17) not noted The reason viruses cause disease is that they
- (18) replicate very very fast by taking over the machinery if you
- (19) would of the living cell and making replicas of themselves
- (20) and in order to get out of that cell they rupture the cell
- (21) wall and are released by the billions and re infect other
- (22) cells So a latent infection is one which lives harmlessly and
- (23) replicating very slowly and not being shed or released from the
- (24) cell
- (25) Q Could you say again that VHS word?

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- (1) A Viral hemorrhagic septicemia
- (2) Q What does hemorrhagic mean?
- (3) A Bleeding
- (4) Q Last word?
- (5) A Septicemia
- (6) Q What does that mean?
- (7) A Combination of Latin a blood infection that's spread
- (8) throughout the body by infected blood
- (9) Q What does the VHS virus do in herring when it's in a latent
- (10) state?
- (11) A What?
- (12) Q Yes
- (13) A Does nothing that I'm aware of
- (14) Q When it's in an active state?
- (15) A Fully active it causes a state of disease I think this
- (16) is a good distinction to make at this time Infection and
- (17) disease are not synonymous As unpleasant as it may seem
- (18) we
- (19) are all infected with things but we aren't all diseased When
- (20) it's an organism an infectious organism begins to cause
- (21) damage
- (22) to our physical or biochemical process and that disease begins
- (23) to show
- (24) Q In the active stage of VHS is it contagious?
- (25) A Yes in the active stage it's very contagious because it's
- (26) being released from the diseased organism or infected
- (27) organism

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- (1) Q How is it transferred to other organisms?
- (2) A Excuse me When the infection is running its full course
- (3) and there are lesions present for instance on the skin the
- (4) virus is being released from the dying cells on the skin so
- (5) this would be released into the water in the case of herring
- (6) were affected Internal organs are also affected the kidney
- (7) being one of the most common organs but other organs are
- (8) also
- (9) affected
- (10) And in the case of the virus that's replicating within the
- (11) bodies of the animals these viruses are released in body
- (12) fluids specifically they could be released in urine or they
- (13) could be released at the time of spawning in ovarian fluid or
- (14) in the milk that contains the sperm from the males
- (15) Q Now had there been outbreak of the disease noted other
- (16) than in Prince William Sound in herring?
- (17) A There has been one other outbreak of the disease that I'm
- (18) aware of in free ranging herring
- (19) Q Where was that sir?
- (20) A Prince Rupert British Columbia
- (21) Q When was that?
- (22) A It was September approximately of 1993
- (23) Q Was there - or had there been a hydrocarbon or petroleum
- (24) release at that time?
- (25) A Two or three weeks - or sometime in August there was a
- (26) diesel spill in this same location where the disease outbreak

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- (1) occurred
- (2) Q Sir is it your opinion that the outbreak of the disease
- (3) the VHS disease that we described that was observed in herring
- (4) that returned in 1993 to Prince William Sound was related to
- (5) the Exxon Valdez oil spill?
- (6) A Yes
- (7) Q Why sir?
- (8) A Based on information that is known about VHS virus in the
- (9) European strain of the virus - I should point out this strain
- (10) that we're talking about in herring was only recognized a
- (11) little over a year ago in herring It was first discovered
- (12) quite to the surprise of most virologists in North America just
- (13) in 1989 and then not even in a disease outbreak but during
- (14) routine virus isolations in coho salmon in Washington so the
- (15) Northern America strain of the virus has been here for a
- (16) relatively short period of time and the recognition of it in
- (17) herring just over a year
- (18) To get back to the question my conclusion is based on the
- (19) information that I know about the European strain of VHS virus
- (20) and the large body of literature that's available on it, and
- (21) it's - this virus is very contagious to susceptible or
- (22) non immune individuals So if the virus is introduced to
- (23) non immune individuals it spreads quick and has a very high
- (24) mortality rate
- (25) In addition to that, it's known that environmental stress

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- (1) can cause a population that's carrying this latent stage of the
 (2) virus that is the inapparent or non-disease stage
 (3) environmental stress can suppress the immune system and
 thereby
 (4) cause this latent infection to become active and the disease
 (5) begins to develop and the virus is released potentially
 (6) causing more harm to individuals
 (7) So based on that information and the fact that the
 (8) hydrocarbons either as individuals or as groups of
 (9) hydrocarbons derived from petroleum are known to suppress
 the
 (10) immune system in mammals birds and fishes I concluded that
 the
 (11) spill very probably contributed to this disease and die-off in
 (12) 1993
 (13) Q Was the disease that was found in Prince William Sound in
 (14) 1993 found as well as in 1994?
 (15) A Yes it was
 (16) Q Was the disease that was found in Prince William Sound
 (17) found in other areas of Alaska such as Sitka or Togiak or
 (18) other areas of British Columbia besides the Prince Rupert area?
 (19) A At this point in time there have been no reports of this
 (20) disease in any of the other areas although the virus has been
 (21) identified at present as a latent phase or a latent stage in
 (22) all of these areas including British Columbia
 (23) Q So the virus is there in other areas but the infection is,
 (24) not there?
 (25) A No The infection is there but the disease is not

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- (1) Q Thank you for clarifying that And it's your opinion that
 (2) the causative agent to connect the decrease in the immune
 (3) system in herring is the Exxon Valdez oil?
 (4) A That's correct
 (5) MR JAMIN Thank you I have nothing further
 (6) THE COURT Cross-examine
 (7) CROSS EXAMINATION OF RICHARD KOCAN
 (8) BY MR COOPER
 (9) Q Good morning Dr Kocan
 (10) A Good morning Mr Cooper
 (11) Q We've seen one another before?
 (12) A I believe we have
 (13) Q On a few occasions?
 (14) A Yes
 (15) Q One quick question Dr Kocan before I forget you were
 (16) talking about your opinion about the oil spill and this
 (17) contagion that you were describing When did you form the
 (18) opinion that it was the virus in the lesions that caused the
 (19) 93 low run size?
 (20) A I first heard about this disease situation in 1993
 (21) following the - its discovery in the spring herring run
 (22) Q In the spring of 93?
 (23) A That's correct
 (24) Q So you formed that opinion fairly soon thereafter?
 (25) A I was of the opinion that the disease that was seen and

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- (1) associated with the - the disease that was observed and that
 (2) the VHS virus that was isolated were indeed cause and effect
 (3) in that the decline in the population was more probably than
 (4) not the result of the disease
 (5) Q All I'm trying to do is find out when you came to that
 (6) conclusion
 (7) A Those were my initial conclusions based on the data
 (8) available at that time
 (9) Q Spring of 93 or thereabouts?
 (10) A Sometimes after
 (11) Q Now I took your deposition on a number of occasions
 (12) didn't I?
 (13) A Many
 (14) Q And let's see let me ask you if I could have - let's see
 (15) it would be page 568
 (16) MR JAMIN Your Honor I object to the use of the
 (17) deposition unless there is some foundation to it The witness
 (18) hasn't testified yet
 (19) MR COOPER I thought he just had when he formed an
 (20) opinion but I'll be happy to ask the next question
 (21) THE COURT Let's set it up so we know why we're
 (22) looking at the deposition
 (23) MR JAMIN Thank you
 (24) BY MR COOPER
 (25) Q Isn't it a fact as of late January of this year you hadn't

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- (1) formed an opinion as to why the lesions were the cause of the
 (2) late returns -
 (3) A I believe in my deposition in sometime in 93 I did make
 (4) that.
 (5) Q Well let me see if I can refresh your memory with your
 (6) deposition
 (7) Dr Kocan if I may Your Honor you want to look at page
 (8) 568 there? That's the deposition that I took on January 19 of
 (9) 1994 right?
 (10) A Yes that's what it states here
 (11) Q And you gave that testimony?
 (12) A Is this the date 1/19/94?
 (13) Q Yes
 (14) A This looks like my testimony
 (15) Q May I?
 (16) A Yes
 (17) Q I'll have to call for help here Your Honor
 (18) Now Dr Kocan I asked you did I not do you know
 (19) whether - you don't have an opinion one way or the other
 (20) whether the source and the virus were responsible for the low
 (21) returns in 1993 Answer no I have no opinion on that
 (22) A Yes I see that
 (23) Q Now I want to come back to this question of the contagion
 (24) but what I want to do first is go back to some of the other
 (25) material in your testimony

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- (1) If I understand your testimony correctly kind of the
 (2) keystone was that you did some laboratory studies accurate so
 (3) far?
 (4) A So far that s correct
 (5) Q And other people and yourself did some field studies out in
 (6) the field?
 (7) A That s also correct
 (8) Q And what you say you found was that your laboratory
 (9) studies which dealt with exposure of herring to Exxon Valdez
 (10) crude oil correlated what was found in the field?
 (11) A Right The types of end points or the types of
 (12) pathological conditions were similar in the two situations
 (13) Q And that s very important in reaching your conclusions
 (14) isn t it that there was those similarities?
 (15) A That s correct
 (16) Q Now let me start with your laboratory study Now you
 (17) showed us the exhibit - or you had the beaker there with the
 (18) I guess it was artificial seawater?
 (19) A That was artificial seawater
 (20) Q And oil Exxon Valdez crude?
 (21) A That s correct.
 (22) Q Fresh Exxon Valdez crude?
 (23) A That wasn t artificial
 (24) Q Did you try to get as much crude - was the way you went
 (25) about preparing that crude oil mixture with the seawater that

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- (1) tell you what the concentrations were that I ultimately ended
 (2) up with
 (3) Q Well you ultimately ended up with some kind of a
 (4) concentration and you proceeded to dilute that?
 (5) A That s correct Once I made the stock solution I diluted
 (6) it with uncontaminated artificial seawater
 (7) Q Now in doing that you didn t set out to try to put into
 (8) that solution - or put into the solution in your artificial
 (9) seawater quantities of crude oil that you believed reflected
 (10) exactly or close to what was out in the field what was
 (11) actually in Prince William Sound?
 (12) A At the time I did that, I had no idea what was in the
 (13) field and it wasn t my intent to do that My intent was to
 (14) get a consistent amount of oil in the water so I could have
 (15) control over that portion of the experiment
 (16) Q And in fact what I need to do is just find out some
 (17) information from you about this exposure regime or the
 (18) quantities that were involved in your laboratory experiment
 (19) If I understood it correctly, you said during your
 (20) testimony that there were and I may be confusing what you told
 (21) me earlier in your deposition but basically there were two
 (22) types of components in this crude oil that you used in your
 (23) laboratory study one of those is high molecular weight is
 (24) that the right phrase?
 (25) A That s correct that would be the diesel range

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- (1) you essentially let that seawater absorb if I m using the
 (2) right word as much crude oil as it would take as the first
 (3) step?
 (4) A The first step was to mix the two in the vessel together
 (5) and this was shaken for about five minutes by the clock and
 (6) then it was allowed to separate overnight for at least 18 hours
 (7) before it was used And the purpose of that was that we wanted
 (8) to be sure that the oil and water were mixed in a way that
 (9) might have occurred you know under an environmental
 (10) condition
 (11) where waves and currents stirred the stuff up
 (12) Q Nobody picked up the Sound and shook it?
 (13) A No but - we weren t prepared to completely duplicate the
 (14) Sound but we tried in a specific manner to get oil to mix with
 (15) seawater so that we could use it in some sort of an exposure
 (16) Q You ll - I was trying to drive at, the way you went about
 (17) doing that was to simply allow that sample of seawater that you
 (18) were using to take into the solution as much oil as it could?
 (19) A That s correct
 (20) Q The maximum amount?
 (21) A Well whatever it was capable of doing I don t know what
 (22) the maximum amount is
 (23) Q You can only get so much crude oil into a solution in a
 (24) given amount of seawater right?
 (25) A I suspect that s true but I don t know if I actually
 saturated this water I couldn t tell you that. I can only

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- (1) hydrocarbons
 (2) Q And the other was low molecular weight?
 (3) A The gasoline range that s correct
 (4) Q Now in your exposure regime - maybe if I got the flip
 (5) chart out here I could do a very crude drawing and we might
 (6) get the idea I m just going to draw a couple of axes on here
 (7) Dr Kocan and I warn you I brought a cheat sheet with me
 (8) because if I don t have a little bit of a preview what I m
 (9) going to draw I probably wouldn t be able to come close to
 (10) it
 (11) Let s assume we have time along here in days one two
 (12) three four et cetera and I believe that you were - these
 (13) experiments that you were conducting these lab experiments
 (14) went on for - was it 18 days or so the exposures with
 (15) varying - well why don t you explain it?
 (16) A Two weeks at least, yes, something like that.
 (17) Q And you made up this stock solution of crude oil in the
 (18) seawater and then you would - starting on day one I guess
 (19) you would start the exposure of the herring embryos or
 (20) whatever to different solutions?
 (21) A Yes that s correct.
 (22) Q Now your lowest solution was what ten percent?
 (23) A One of the lowest was zero
 (24) Q That s with no crude oil?
 (25) A That s correct.

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- (1) Q But the next one up?
- (2) A I believe it was a tenth of a percent of hydrocarbon -
- (3) total of a percent of the initial extract
- (4) Q Of the initial extract And that had it in low molecular
- (5) weight as well as high molecular weight hydrocarbons?
- (6) A Right that s correct both should have been in there
- (7) Q Let s take the high molecular weight hydrocarbons in your
- (8) lowest concentration not the control but the lowest
- (9) concentration with crude oil that concentration ended up
- (10) putting about how many - can you put it in parts per billion
- (11) of crude oil of this high molecular weight compound?
- (12) A I believe it was 01 parts per billion which would be ten
- (13) parts per million
- (14) Q I ll put that down here and this will be ten parts per
- (15) billion Now you also had these light ends or the light
- (16) molecular weight -
- (17) A Low molecular weight that s correct
- (18) Q And those evaporate off over a period of time?
- (19) A Very quickly yes
- (20) Q Now about how many of those did you have in the solution
- (21) when you used it again at the lowest concentration ten
- (22) percent one?
- (23) A I may be able to calculate that in my head I believe at
- (24) the stock concentration it was about 64 parts per million so
- (25) you would dilute it by 100 times to give you the lowest

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- (1) concentration
- (2) Q Well I thought the way that we had calculated it before
- (3) and I may be wrong but I thought it worked out to be about 70?
- (4) A 70
- (5) Q Parts per billion?
- (6) A Per billion I m sorry I was talking in parts per
- (7) million It could be 70 parts per billion
- (8) Well it couldn t be because 64 was the original
- (9) concentration if you take ten fold dilutions down to a tenth
- (10) it would be some multiple of 64
- (11) Q So about 60 parts per billion and that starts off and for
- (12) some period of time that s in there and then it disappears
- (13) because those evaporate off?
- (14) A Uh huh
- (15) Q Does it ever disappear completely or do you end up with
- (16) some component of those light molecular hydrocarbons that
- (17) stays
- (18) in there?
- (19) A Well it ultimately reaches a point where it s
- (20) undetectable so if it s there I don t know about it
- (21) Q But in any event you renewed your solution every two days?
- (22) A Every 48 hours
- (23) Q Every 48 hours you poured a new mixture into whatever
- (24) vessels you had the herring in?
- (25) A Yes that s correct
- (26) Q So on day one you have this spike up here and then on day

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- (1) three you get another spike like that more or less?
- (2) A That would be a correct representation
- (3) Q And then on day five you get another spike?
- (4) A That s correct
- (5) Q So that basically the concentrations that you re exposing
- (6) these herring to you ve always got at least ten parts per
- (7) billion of the heavy molecular weight hydrocarbons plus a
- (8) varying shot of the lower molecular weight hydrocarbons?
- (9) A That would be a correct analysis
- (10) Q And we re talking somewhere - they are getting in
- (11) somewhere between about a total of about 70 to down to 10
- (12) parts
- (13) per billion exposure?
- (14) A That would be a close estimation yes
- (15) Q Now I believe you used a term that kind of caught my ear
- (16) when you said it but I think at one point Mr Jamn asked you
- (17) if your exposure in the lab reflected I think may have been
- (18) his term what the exposures were actually out in Prince
- (19) William Sound And I think the word you used at least as I
- (20) caught it you said well It s possible and then you talked
- (21) about how difficult it is to measure things out in the Sound
- (22) Did I remember that right?
- (23) A That s essentially correct
- (24) Q And I guess you say it s possible but you don t - you
- (25) didn t really go out yourself and measure what was in the
- (26) Sound
- (27) to know if these various concentrations reflected what was

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- (1) happening out there with the Exxon Valdez crude in this what
- (2) you call I think very complex situation?
- (3) A No I didn t personally do that
- (4) Q There are some people who did that correct?
- (5) A Yes there are
- (6) Q And those include Mr Shortenrounds (ph) from NOAA?
- (7) A I believe so
- (8) Q And Dr Jerry Neff somebody that Exxon hired to go look at
- (9) that question?
- (10) A Yes that s correct
- (11) Q And we ll obviously be hearing from Dr Neff and maybe
- (12) about what some of those other people found but let me see if
- (13) I understand the point the fundamental point here I guess
- (14) that substances can harm you at certain concentrations At
- (15) other concentrations or lower concentrations they may not We
- (16) can probably agree on that?
- (17) A That s roughly correct but it s not - it would require
- (18) some definitions It s not quite that straightforward
- (19) Q Well I guess what I m thinking of and maybe this makes
- (20) the point too simply but if I get a headache and I take some
- (21) aspirins it probably would do me some good if I took 10 000
- (22) it would hurt me?
- (23) A That s correct
- (24) Q So I assume what you would have to do is figure out or
- (25) conduct whatever experiments you re going to conduct at some

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- (1) level of exposure that's going to reflect what in fact is
 (2) going to happen out there in the field where the people are
 (3) taking the aspirin?
 (4) A This is generally true if you're dealing with drug type
 (5) exposure experiments that is where humans are going to be
 (6) involved with actually taking these drugs but in the field of
 (7) toxicology where we don't always have the luxury of waiting a
 (8) lifetime of a human being or the short life of an animal
 (9) experiments are done and tests are done using concentrations
 (10) that would produce a realistic response in the amount of
 (11) time - in a reasonable amount of time so that you could
 (12) determine whether or not these compounds were actually toxic
 (13) and you could determine what the outcome of this toxicity was
 (14) that is what you would expect to see what type of damage was
 (15) done how long it would take under those conditions And from
 (16) that you draw a conclusion as to the toxicity of the material
 (17) rather than the concentration
 (18) You would then have to do a bioassay to determine how much
 (19) of this material is actually needed to produce a particular
 (20) response and then this of course is dependent on the time of
 (21) exposure how long it's been exposed to a particular
 (22) concentration and in this case I think more importantly
 (23) what stages of the organisms are being exposed because of
 (24) differential susceptibility particularly in developing
 (25) embryos

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- (1) So it's not a straightforward situation where a specific
 (2) dose over a 24 hour period or whatever gives you all the
 (3) answers that you want
 (4) Q If I picked up on one part of that answer I guess
 (5) obviously if you're dealing with young children and how many
 (6) aspirin it might take to harm them it's going to be a
 (7) different number than adults That's one thing you're saying?
 (8) A Yes that's basically true but that wasn't the point I was
 (9) trying to make We weren't talking about aspirins either
 (10) Q Let me ask you one thing before I fall and break my neck on
 (11) the electrical cords On these spikes that we were talking
 (12) about those are there because you were using basically fresh
 (13) crude oil every time you renewed - well, when you mixed your
 (14) stock solution and then when you renewed it?
 (15) A The stock solution was fresh that's true I guess from
 (16) a - to be precise the oil I was using had been taken off of
 (17) the Exxon Valdez at least two years prior to that time, and it
 (18) was the same oil that I used throughout this experiment to make
 (19) each of my stock solutions So it wasn't quite as fresh as it
 (20) was when I left the deck - well the tanks of the decks - the
 (21) solution I used was fresh each time
 (22) Q Did you try to take some steps to make it about as fresh as
 (23) what was on the Exxon Valdez at the time of the spill?
 (24) A Yes The bottles were sealed and kept cool I didn't let
 (25) them open so that things would evaporate I tried to keep it

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- (1) as constant as possible throughout the course of the
 (2) experiment standard laboratory practice
 (3) Q So if the - if you had to go - were to go out in the
 (4) field and try to find some exposure regime that corresponded to
 (5) this basically you would need to find one where you had this
 (6) every couple of days this fresh shot of basically fresh crude
 (7) oil in these concentrations down there in the water column
 (8) over I guess a two-week 18-day period?
 (9) A If you wish to replicate that scenario yes you would have
 (10) to do that. But I should also point out that in the situation
 (11) that occurs in Prince William Sound you're not dealing with
 (12) sterile seawater under laboratory conditions You're dealing
 (13) with seawater that's filled with all sorts of particulate
 (14) matter and animal components and plant debris and sediments
 (15) being resuspended that's been previously contaminated whole
 (16) oil at the surface and at the bottom
 (17) They're very complex There is no way you're going to go
 (18) into the field and replicate what I did in the laboratory any
 (19) more than I can replicate Prince William Sound in the
 (20) laboratory The true experiment to determine what would
 (21) happen
 (22) in Prince William Sound or what the effect of oil was in Prince
 (23) William Sound is to have a parallel universe with another
 (24) Prince William Sound where a spill did not occur And that's
 (25) the ultimate experiment. That's not practical only in Star
 Trek

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- (1) Q I don't think we can figure out how to do that.
 (2) A They do on Star Trek
 (3) Q But I think you said what I was driving at This doesn't
 (4) replicate what was going on in the Sound?
 (5) A No This was designed to demonstrate the effects of crude
 (6) oil on herring embryos
 (7) Q Let me just ask you one other thing about that study Did
 (8) you try to avoid having any droplets in the water any droplets
 (9) of water in the solution that you were exposing these herring
 (10) to?
 (11) A Are you talking about whole oil droplets droplets of the
 (12) crude as opposed to the soluble -
 (13) Q Yes
 (14) A Yes I went to great pains to avoid that as much as
 (15) possible
 (16) Q Do you think you did?
 (17) A Based on the tracings I got back from the analytical
 (18) laboratory they showed me that they consisted of either the
 (19) gasoline range and diesel range hydrocarbons but not whole
 (20) petroleum which I would expect to have seen if I had
 (21) droplets And the way this was done was to let the oil and
 (22) water separate over a long enough period of time so all the
 (23) whole oil floated back to the surface so I could drain the
 (24) uncontaminated water off the bottom
 (25) Q There was one piece of paper I saw Do we have 1978?

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- (1) We ve got it here I ll ask you about it
- (2) Let me show you a copy of - do you remember we asked you
- (3) for your lab notebooks and the material you got back from the
- (4) laboratory that analyzed your solutions?
- (5) A Yes
- (6) Q And this is what you provided us in connection with that
- (7) You re welcome to take a look at that.
- (8) MR JAMIN Which page were you referring to?
- (9) MR COOPER Do we have a page number on that?
- (10) THE WITNESS 00150
- (11) MR COOPER Production number 00150
- (12) MR JAMIN I think you need one more digit
- (13) BY MR COOPER
- (14) Q I guess you ve had a chance to look at that?
- (15) A Yes I recognize this This is mine and it s what I
- (16) supplied to you
- (17) Q What interested me obviously as I m sure you guessed was
- (18) the comment in the margin there Can you read that?
- (19) A The handwritten comment?
- (20) Q Yes
- (21) A The handwritten comment in the margin refers to value of
- (22) hydrocarbon concentration And it says error droplets of oil
- (23) present
- (24) Q Does that mean that there were some droplets that were
- (25) present - apparently were in the solution that you were using?

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- (1) A In - yes in that particular sample there were droplets
- (2) I think if you have a copy of your own on the left hand
- (3) column - or the far left of the columns there is a
- (4) hand written comment that says separation time and then it
- (5) section X 20 hours X 20 hours X 5 hours and X 20 hours That
- (6) represents the time the oil and water were allowed to separate
- (7) before I took the water off the bottom and the error is marked
- (8) after the 5 hour column which is why we didn t use the samples
- (9) until they were at least 18 hours or more old because oil
- (10) droplets were present and did contain whole oil We knew that
- (11) whole oil was there
- (12) Q So the reason that s there is because you were trying to be
- (13) careful to make sure you had no droplets in the oil?
- (14) A Yes that s correct
- (15) Q Or in the solution?
- (16) A In the solution yes
- (17) Q And the reason that you wanted to make sure you had no
- (18) droplets in there was because you really - that would throw
- (19) off your calculations of the concentrations and the amounts
- (20) It would just kind of put a wild card in there so you couldn t
- (21) interpret the results very well?
- (22) A The reason we didn t want that in there is because it s
- (23) pretty much of an uncontrolled variable and this was intended
- (24) to be a controlled experiment where we had no variables that
- (25) weren t under our direct control and oil droplets are not

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- (1) something that are very stable and they aren t uniformly sized
- (2) and they don t make this - they make it very difficult to
- (3) maintain the concentrations or determine the concentrations
- (4) you
- (5) want so we eliminated that one variable
- (6) Q Now if you saw hydrocarbons in your - chromatograms?
- (7) A Yes
- (8) Q If you saw hydrocarbon in your chromatograms that were
- (9) insoluble in water would that indicate you had droplets in
- (10) there?
- (11) A If it didn t come from that particular sample if it came
- (12) from the sample that I had used in my experiment right.
- (13) Q Do you know what the solubility in water would be of a C-20
- (14) alkanes? Would that be soluble?
- (15) A Relatively insoluble
- (16) Q And the same for C-16 and C 12 alkanes?
- (17) A The smaller they get the more soluble
- (18) Q They aren t all equally soluble in water?
- (19) A No Each of the molecules has a different solubility
- (20) Q Let me leave the subject of your laboratory test at least
- (21) for a while We may want to touch on it some more but let me
- (22) go back to some of these field studies that you referred to in
- (23) the course of your examination
- (24) THE COURT Sounds like we re changing subjects
- (25) Let s take our first break at this point We ll be in recess

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- (1) (Jury out at 10 00)
- (2) (Recess at 10 00)
- (3) (Jury in at 10 17)
- (4) BY MR COOPER
- (5) Q Dr Kocan I think we were about to move - talk about
- (6) some not all but at least some of the field studies that you
- (7) referred to One of those if I recall correctly you referred
- (8) to studies that showed that there was increased embryo
- (9) mortality this 1989 year class?
- (10) A Excuse me The 1989 year class we re talking about?
- (11) Q Yes
- (12) A The increased embryo mortality - actually that was
- (13) increased larval mortality from egg deposition to yolk sac
- (14) absorption That was a study done in 1989 and the overall
- (15) range of that was oh from the time the eggs were deposited by
- (16) the females until approximately the time the yolk sac was
- (17) resorbed
- (18) Q There was a study you did I think you referred to as your
- (19) in situ -
- (20) A In situ
- (21) Q Probably not the first scientific term I ll get wrong
- (22) A I may be wrong
- (23) Q That was the one where you basically referred was it eggs
- (24) and sperm from spawners and then artificially incubated or
- (25) artificially fertilized those and then put the embryos into

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- (1) the canisters in streams that had been oiled in 89 or areas
 (2) that had been oiled and areas that had not been?
 (3) A That's generally correct yes
 (4) Q Now you purported to find that there was in effect
 (5) abnormalities or different mortality rates in the ones - the
 (6) canisters that had been placed in the oiled versus the unoiled
 (7) areas?
 (8) A The major effect that was most dramatic was the weight
 (9) differences between the two sites. There was also a difference
 (10) in the number of - I believe it was the number of viable
 (11) offspring. I would have to see the data exactly but there was
 (12) a difference between abnormalities or viability of the larvae
 (13) but there was no difference in the hatching rate that I'm aware
 (14) of.
 (15) Well I'd have to back up on that. There is some variation
 (16) here that I can't recall from every one of these studies but
 (17) there are some differences by 1991 that aren't particularly
 (18) clear-cut in my studies.
 (19) Q Would you agree that there is a major difficulty with
 (20) respect to the data from that study as well as perhaps others
 (21) and that's the lack of background data which this kind of data
 (22) can be compared?
 (23) A I'm not sure what you mean by background data. Could you
 (24) clarify?
 (25) Q Well how about the ability to distinguish effects of the

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- (1) oil from just natural - or effects of just natural variation
 (2) differences between the streams for instance - not the
 (3) streams but the areas where you deployed the eggs?
 (4) A There is also some difficulty when one works in the field
 (5) with trying to interpret data because every aspect of your
 (6) experiment or your study is not under your control. The ideal
 (7) experiment is one where there is only one variable everything
 (8) else is constant and you have control over that variable.
 (9) Anytime one gets involved in a field study there are some
 (10) variables that are beyond your control such as different sites
 (11) are in different places that's why they are different and
 (12) they may have different kinds of gravel on the bottom or
 (13) something.
 (14) But one does try to the best to their ability to interpret
 (15) the data in light of those things that could cause an effect.
 (16) I mean some things just have no effect they are irrelevant
 (17) and others may have an effect. And if that's the case, you can
 (18) design your experiment to account for those.
 (19) But that more or less answers the question. It's not a
 (20) perfectly controlled experiment.
 (21) Q Didn't you yourself conclude that the major difficulty with
 (22) interpreting the extensive data collected was the lack of
 (23) background data to which it compared and the ability to
 (24) distinguish effects from natural biological -
 (25) A That comment was not made just to my specific experiments

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- (1) That comment was made to background data in general on
 species
 (2) and populations in Prince William Sound
 (3) Q That comment is your - that reflects your belief doesn't
 (4) it?
 (5) A My belief is that there is everywhere a lot of background
 (6) data that is not available to us and this makes the designing
 (7) of these experiments more complicated or complex in that we
 (8) have to create the background data at the time we do the
 (9) studies rather than have something to compare it to. A dilemma
 (10) we have to deal with.
 (11) Q It's just dealing with it at the time you create the
 (12) studies. Doesn't that lack of background data present a major
 (13) difficulty with interpreting it with interpreting the results
 (14) of these studies?
 (15) A It does present difficulties but they are not
 (16) insurmountable and in some cases they are surmountable.
 You -
 (17) can make that interpretation and I expect there are other
 (18) occasions where you're going to have more difficulty making
 (19) those interpretations. I've made every attempt to eliminate
 (20) this as much as possible within the confines of the studies I
 (21) did.
 (22) Q Let me just ask you you can answer yes or no is it your
 (23) belief that the major difficulty with interpreting the
 (24) extensive data is the lack of background data to which it can
 (25) be compared and your inability to distinguish effects from

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- (1) natural biological evaluation?
 (2) A I would have to deal with it on a case-by-case basis
 (3) because background data is available in some cases and not in
 (4) others and not as much as I would like. You have to give me a
 (5) specific set of data and a specific set of circumstances before
 (6) I can say I can't do that. In general there is not the amount
 (7) of data that I would like there to be.
 (8) Q Let me just ask you this question. Did you make that
 (9) statement that I just repeated or did you not?
 (10) A I may have made it but I certainly didn't make it in the
 (11) context of a specific set of data.
 (12) Q It was with reference to extensive data that had been
 (13) collected since March of 1989?
 (14) A It was a generalized statement more or less a statement of
 (15) frustration in that I would like the things to be better than
 (16) they were.
 (17) Q Now you showed us a number of slides of defective larvae
 (18) and malformed larvae and so forth?
 (19) A Correct.
 (20) Q Is it true Dr Kocan that skeletal deformity can
 (21) represent or does represent a non-specific response to physical
 (22) as well as chemical insults?
 (23) A Yes. There are a number of different types of agents or
 (24) conditions that could cause spinal deformities.
 (25) Q Do these things include - well what kinds of things can

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- (1) affect that? Temperature?
 (2) A Well in some fish species temperature can be a factor
 (3) however the temperature has to change very quickly over a
 (4) short period of time in usually just the very earliest stages
 (5) of development when there are two four 16 18 cells
 (6) present Once it goes beyond that most species are
 (7) generally
 (8) Q Salinity can that have an effect on that sort of thing?
 (9) A Again very short time
 (10) Q But it can have an effect?
 (11) A Yes
 (12) Q You get differences of salinity coming in from different
 (13) locations?
 (14) A Gradual not instantaneous
 (15) Q Abrupt you get the snow melt in the springtime more than
 (16) in the middle of winter?
 (17) A They occur more rapidly I think we need to frame this in
 (18) terms of what I'm describing as a short time and what you're
 (19) describing I'm talking several degrees change over a few
 (20) minutes not several degrees change over the course of a few
 (21) days or weeks
 (22) We routinely transport eggs from one temperature to another
 (23) or move from one temperature to another by allowing them to
 (24) float in their aquarium or their bag of water to float in the
 (25) tank or the body of water that has the temperature that we want

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- (1) was not one to determine the concentrations that were there
 (2) relative to what I saw The experiment was designed to
 (3) determine whether or not those sites had any residual effect on
 (4) development of these embryos regardless of what caused that
 (5) effect and that's how the studies were designed and the
 (6) results were interpreted in light of that
 (7) Q Well do you remember writing Dr Kocan in an article on
 (8) the use of herring for in situ and in vitro monitoring of
 (9) marine pollution do you remember writing in substance this
 (10) Unfortunately mortality in skeletal deformity represent
 (11) non specific responses to physical and chemical insults in
 (12) order to implicate specific substances as the cause of such
 (13) damages or such changes it would be necessary to conduct
 (14) more
 (14) extensive analyses of water and sediment and to conduct
 (15) laboratory studies?
 (16) A That sounds - well the title of the paper you read
 (17) definitely sounds like one I wrote and I will concede that I
 (18) probably wrote that but I think I need to clarify something
 (19) here And that is that I know of personally dozens of
 (20) chemicals that can cause the types of problems that I
 (21) described some of which have nothing to do with petroleum
 (22) hydrocarbons X rays and gamma rays can also do this
 (23) Q Ultraviolet rays?
 (24) A I'm not sure about ultraviolet rays particularly under
 (25) water What I do know about this situation is that none of

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- (1) them to equilibrate to And it may take them an hour or two
 (2) and there is no adverse effect
 (3) Q Well coming back for a moment to the in situ study isn't
 (4) it the case that in order to implicate a substance like the
 (5) Exxon Valdez crude oil as the cause of the changes that you
 (6) believe you saw in that study that it's necessary to conduct
 (7) some extensive analyses of the water and sediment chemistry?
 (8) A I think there was more in there than what I caught - could
 (9) we go through that again?
 (10) Q Well you discovered or you believed that you found that
 (11) there were some things defective some things wrong with the
 (12) herring that you incubated or raised in the oil streams as
 (13) compared to the ones in the unoled streams in your in situ
 (14) study?
 (15) A Yes I found differences between the two
 (16) Q When you did that study you didn't go out to the places
 (17) where you deployed those canisters and try to take any
 (18) chemistry measurements to see how much Exxon Valdez crude
 (19) oil
 (19) if any had been there?
 (20) A No That wasn't part of the question I was addressing
 (21) Q When you did that study you weren't interested to know
 (22) whether or not there was in fact Exxon Valdez crude oil at the
 (23) location where you were - where you ultimately ascribed an
 (24) effect to that crude oil?
 (25) A Well I was interested but again the design of the study

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- (1) those compounds - or nobody has demonstrated that anything
 (2) other than petroleum hydrocarbons in huge amounts as present
 (3) in
 (3) Prince William Sound in those sites This is the most possible
 (4) source of any problems because it was there it was seen
 (5) there I saw videos of it washed and covering the submerged
 (6) vegetation I saw the rocks covered with it I saw videotapes
 (7) of the surface being coated with it I saw the data indicated
 (8) that it was washed to the bottom and taken up by mussels that
 (9) filter feed from the water column
 (10) So my conclusion is based on the presence of oil that also
 (11) has the components that are capable of producing those effects
 (12) being there at the time that the embryos were there Whether I
 (13) measured it or not at this point is not important.
 (14) Q It would make no difference to you if in fact where you
 (15) deployed those canisters with the herring embryos if the
 (16) waters and the sediments there had no hydrocarbons at all from
 (17) the Exxon Valdez spill?
 (18) A Well I know for a fact that's not true The water column
 (19) may have been clean but the water column -
 (20) Q But Dr Kocan we're talking about the places where you
 (21) put these canisters?
 (22) A That's correct.
 (23) Q You didn't take any chemistry measurements to see if there
 (24) was any oil from the Exxon Valdez or any other source in those
 (25) locations where you put their canisters?

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- (1) A No I didn't take measurements but the oil had been there
 (2) the oil was reported from there
 (3) Q Maybe it was there before you ever put those canisters
 (4) there but you took no measurements when those canisters
 were
 (5) there to see if there was any oil there did you?
 (6) A No not at that time I didn't that is correct
 (7) Q Now you mentioned a reproductive success study Do you
 (8) recall that one?
 (9) A Yes
 (10) Q And that's the study where you gathered some spawning fish
 (11) from areas in what year 1992?
 (12) A 1992
 (13) Q So we're three years after the oil spill?
 (14) A That's correct
 (15) Q And you gathered some spawners and some spawning
 herring
 (16) from areas that had been oiled three years before?
 (17) A Correct.
 (18) Q And then you gathered some from areas that had not been
 (19) oiled three years before?
 (20) A That's also correct
 (21) Q And you basically artificially spawned them am I right?
 (22) A That's correct
 (23) Q And then looked to see how the offspring did?
 (24) A Yes I reared the eggs from each individual fish There
 (25) were three groups of 25 in this case I reared them

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- (1) individually and determined the number of viable offspring that
 (2) each fish produced from each of the collection sites
 (3) Q Now you didn't definitely know if the spawning fish that
 (4) you collected were fish that had in fact, been spawning in
 (5) that location at the time of the spill three years earlier?
 (6) A That's correct
 (7) Q So for all you know they may have spawned in some area in
 (8) the northern part of the Sound where oil from the spill had
 (9) never reached?
 (10) A They could have spawned in another part of the Sound
 (11) that's correct
 (12) Q And because it's not definitely known if the spawning fish
 (13) were exposed to petroleum hydrocarbons as one year olds, or
 (14) that they even spawned in the same areas where they reared, it
 (15) wasn't possible was it for you to determine if the observed
 (16) effects resulted from the oiling or from some site specific
 (17) differences?
 (18) A In regard to that study I'd like to clarify that. The
 (19) study was designed to look at specific spawning - herring from
 (20) specific spawning sites
 (21) Q Excuse me Dr Kocan I'm not sure you're answering the
 (22) question What I just - the question that I just asked you
 (23) is that true or is it not true?
 (24) A Repeat the question minus all the narrative
 (25) Q Well I don't want to make it a big secret, the narrative

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- (1) is there because you wrote it
 (2) A I'd like to concentrate on the question so I can get that
 (3) clear
 (4) Q Because it's not definitely known if the spawning fish were
 (5) exposed to petroleum hydrocarbons as yearlings or if they
 (6) spawned in the same area where they were reared during the
 (7) spill it was not possible to determine if observed effects
 (8) resulted from some site specific effect or if the spawning
 (9) fish were carrying some sublethal damage incurred during the
 (10) previous years
 (11) A That's correct I can't tell you if they had been
 (12) previously exposed or if it was a site specific effect All I
 (13) know is that the result showed that those fish from oiled sites
 (14) had lower offspring survival rate than fish from unoiled
 (15) sites Other than that I can't make any other statement
 (16) Q Now incidentally with respect to that study what you saw
 (17) in that study cannot account for the disappointingly low runs
 (18) in 1993 and 94 can it that is to say less viable offspring
 (19) from those 1988 year class fish?
 (20) A Well I can't really make a prediction on that on whether
 (21) or not that spawning difference had an effect on subsequent
 (22) year classes because I haven't really studied that and the
 (23) decline in 1993 was not a result of new fish not coming into
 (24) the population but my understanding it was a result of a
 (25) large number of fish that were already there disappearing

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- (1) Q Well I guess what I'm saying is the offspring that you
 (2) looked at in that study were fish that would not recruit into
 (3) the spawning population in any event until when about 1995
 (4) 1996?
 (5) A The '92 year class would have first recruited as three
 (6) years olds in 1995 and four year olds in 1996 correct
 (7) Q Precisely So it wasn't their failure to appear that
 (8) somehow accounted for the run failure in 1993 and 1994?
 (9) A No There is no way to know that
 (10) Q Let me turn to a little different subject here You talked
 (11) about genetic effects of the crude oil I'm sure you remember
 (12) that subject?
 (13) A Correct. Yes I did
 (14) Q And you told us about somatic cells and germ cells?
 (15) A Yes that's correct also
 (16) Q Now let me see if I understand this correctly You also
 (17) showed us these pictures of anaphase aberration if I've got
 (18) the right term?
 (19) A That's correct
 (20) Q Where something in the division of the cell goes haywire -
 (21) A That's correct.
 (22) Q - to use a scientific term
 (23) I'll tell you what let's use an example Use me as an
 (24) example I've got a lot of cells in my body I assume at
 (25) least I hope I do Do you know how many cells there are in a

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- (1) herring?
 (2) A I would estimate millions
 (3) Q Millions of them?
 (4) A Yes
 (5) Q And let s assume that - well what you did is you looked
 (6) at herring that had been killed and dead tissue samples and
 you
 (7) examined them for for instance these genetic or cytogenetic
 (8) aberrations?
 (9) A That s correct We looked at cells from newly hatched
 (10) larvae
 (11) Q Now chromosome defects occur naturally sometimes in
 some
 (12) pretty large numbers don t they?
 (13) A Well not naturally in large numbers but they do occur
 (14) naturally in the normal course of cell division that s
 (15) correct
 (16) Q Now if I ve got a chromosome - or a cell that s got a
 (17) chromosome in it that cell then splits up divides up and in
 (18) order to work all right it s got to have a duplicate of the
 (19) chromosome in each - in the daughter cell is that what you
 (20) call it?
 (21) A Yeah
 (22) Q And if there is one of these anaphase aberrations like you
 (23) were talking about one possibility is it not that the - as
 (24) part of that cell division process there is a proofreading
 (25) process that the body has?

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- (1) A Yes that s correct The body has a DNA repair mechanism
 (2) to fix any mistakes - fix mistakes during normal cell
 (3) division
 (4) Q So it s possible if there was some foul up in cell
 (5) division it s possible that the proofreading process will see
 (6) that and fix it?
 (7) A Within reason
 (8) Q Within reason?
 (9) A Yes
 (10) Q Another possibility is that the cell that doesn t work and
 (11) simply immediately dies?
 (12) A That s ultimately what happens that s correct.
 (13) Q That s generally what happens isn t it? Most instances
 (14) that s what happens?
 (15) A Yes Damage to - fixed damage to a cell or to DNA
 (16) components of the cell results in death of the cell right.
 (17) Q That can happen simply as another cell death that we have
 (18) going on all the time and there may be no permanent effect of
 (19) that?
 (20) A Well it depends on how extensive it is Yes we have
 (21) cells dying all the time If we have massive amounts of cells
 (22) dying it would be a serious effect yes
 (23) Q But if it dies whatever is wrong with these genes or these
 (24) chromosomes it never gets passed on to any more cells the
 (25) process stops right there?

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- (1) A In that particular cell that s correct
 (2) Q Now for a defect in these cells or in the chromosome in
 (3) the cells to have an impact it must impact - well the gene
 (4) could be one of how many genes that are affected? How many
 (5) genes are there in a herring?
 (6) A I don t know I think we re just starting to find that out
 (7) in a human
 (8) Q In a human how many are there?
 (9) A Genes?
 (10) Q Yes
 (11) A Thousands
 (12) Q Some of them control important things some of them may
 (13) control unimportant things?
 (14) A I guess it s what part of you that it s controlling that
 (15) you consider important
 (16) Q They will be wide-ranging effects?
 (17) A Yes all parts of your physical and functional person
 (18) Q And there may be some that are just historical baggage that
 (19) nobody has figured out what they control?
 (20) A I hesitate to use the term "baggage" I would be more
 (21) prone to say we may not know what their function is
 (22) Q Well in the studies that you did where you discovered
 (23) cytogenetic damage of one kind or another -
 (24) A Yes
 (25) Q - did you do any studies to find out what genes were

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- (1) impacted and what those genes that were impacted did for the
 (2) organism?
 (3) A No
 (4) Q So you don t have any idea what those genes may affect if
 (5) anything?
 (6) A No The type of test the anaphase aberration represents is
 (7) pretty much a broad spectrum It represents that damage is
 (8) occurring and it s occurring at many different levels within
 (9) the genome and to determine every one of them would take
 many
 (10) people many lifetimes
 (11) Q If you just visually detect cytogenetic - which is what
 (12) you were doing?
 (13) A Yes
 (14) Q That doesn t let you determine if the damaged cells are
 (15) viable right so far?
 (16) A Right
 (17) Q Doesn t allow you to determine if they are capable of
 (18) replication?
 (19) A That s correct
 (20) Q And incapable of replication?
 (21) A That s correct
 (22) Q And it doesn t allow you to tell whether alteration in
 (23) those chromosome components are transmitted to subsequent
 (24) generations?
 (25) A That s correct. We just know that there is damage

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- (1) occurring or there is excessive amount of damage occurring
 (2) Q And I noticed in your testimony if I heard it right you
 (3) didn't try to say because of this cell damage we know that X
 (4) amount of herring were killed or impaired or whatever you
 (5) don't really know that do you?
 (6) A No As I said the result of this type of genetic damage
 (7) are multiple effects ranging from death to relatively minor
 (8) inconsequences
 (9) Q Observing the cytogenetic damage that you did doesn't tell
 (10) you what on that range of consequences may have happened?
 (11) A It doesn't tell you basically but the entire range is
 (12) covered and you can't quantitate by that type of test but you
 (13) can know that it's in the expected normal level of damage
 (14) Q You did talk about inheritance You showed us the charts
 (15) of the recessive genes and talked about a word that I can't
 (16) repeat but I think it was albinism?
 (17) A Yes
 (18) Q Did it get it right?
 (19) A Yes
 (20) Q Now in order for a genetic damage to get passed on to
 (21) future generations that genetic damage - let me back up
 (22) if I've got a cell in the tissue of my arm that has its
 (23) genes fouled up that doesn't mean that my offspring are going
 (24) to inherit the same thing does it?
 (25) A If that cell were damaged in your body in your arm no it

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- (1) wouldn't but if you inherited that from one of your parents
 (2) it could be
 (3) Q I was going to get there but I wanted to work it
 (4) downstream instead of upstream don't want to cast any
 (5) aspersions on my ancestors
 (6) In order for me to pass on to my offspring some kind of a
 (7) genetic defect and here is where I begin to wish I hadn't made
 (8) this personal analogy - for a critter in order to pass
 (9) along a genetic defect to its offspring it has to have that
 (10) genetic effect to occur in either a sperm cell or an egg cell
 (11) is that right?
 (12) A That's correct
 (13) Q So if it's just something that occurs in any of the other
 (14) cells that we've got it won't get passed on genetically?
 (15) A That's also correct
 (16) Q And about - do you know about how many sperm cells a
 (17) herring has?
 (18) A Millions maybe billions
 (19) Q How about egg cells?
 (20) A I think the average and this is an average it's a wide
 (21) range on both sides depending on the size of the herring it's
 (22) about 20,000 eggs
 (23) Q So -
 (24) A Per year
 (25) Q So for the genetic defect to get passed on number one it

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- (1) has to end up in a sperm or an egg the bad gene has to be
 (2) there?
 (3) A That's correct
 (4) Q Whatever this hydrocarbon or whatever the genotoxin was
 (5) that got into the body it's got to work its way down into a
 (6) sperm cell or an egg cell?
 (7) A The damage had to have occurred in one of the germ cell
 (8) lines that's right
 (9) Q And then if it happens to be in a sperm or an egg that
 (10) never gets fertilized kind of no harm no foul?
 (11) A That's true
 (12) Q So it has to be - do you have any idea in a herring about
 (13) how many of the sperm let's say actually end up fertilizing
 (14) an egg?
 (15) A I can't give you an exact number but I can say that the
 (16) number of sperm probably approximate the number of fertile
 (17) eggs
 (18) Q Just takes one?
 (19) A Yes but if there is two eggs that are fertilized then
 (20) sperm -
 (21) Q I guess the point -
 (22) A I don't have an exact number
 (23) Q The point I'm driving at there is going to be a lot of
 (24) sperm that never fertilize an egg and if there is a genetic
 (25) defect it doesn't account for anything?

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- (1) A That's correct if they are not used they have no effect
 (2) Q Let me go to another subject that you discussed toward the
 (3) end of your direct testimony and that's this question of the
 (4) VHS virus
 (5) A Yes
 (6) Q Now you kind of - you explained what this theory is that
 (7) you have as to how the VHS virus may account for the low runs
 (8) in 1993 and 1994?
 (9) A Yes
 (10) Q And in order for that theory to work - well maybe you
 (11) should explain this or at least one element of it for me
 (12) Your theory is that the 89 year class fish were somehow
 (13) compromised in their immune systems is that the starting
 (14) point?
 (15) A Well my opinion is that the 89 year class was the most
 (16) susceptible to the type of damage - to damage the immune
 (17) system but all your classes were at risk
 (18) Q What you're suggesting is that the hydrocarbons may have
 (19) injured the immune systems of the 89 year class era?
 (20) A Yes
 (21) Q Is this a genetic thing or just an injury to an immune
 (22) system that you're talking about?
 (23) A It can take two different routes As an individual any of
 (24) us our immune system can be damaged directly by exposure
 (25) to hydrocarbons and in that case during the period that they

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- (1) are - that the immune system is compromised we would be
 (2) susceptible to infection by diseases and invasive organisms
 (3) and we could recover from that and the immune system may
 repair
 (4) itself
 (5) On the other hand if a developing embryo were exposed the
 (6) embryonic cells that I showed in my presentation yesterday
 (7) prior to the time they became lymphocytes and T-cells and
 (8) betalymphocytes and whatnot and start producing antibodies
 the
 (9) precursors to those cells if they were damaged then they
 (10) would never function normally and then the animal could
 (11) conceivably live its entire life without a functional immune
 (12) system So there are two ways could be genetic or direct
 (13) function on the system
 (14) Q Are there ways that scientists and biologists who do the
 (15) kind of things you do can conduct tests to determine if an
 (16) immune system has been compromised?
 (17) A Yes there are tests to measure this type of damage
 (18) Q What do you call those tests?
 (19) A Immuno competence tests comes to mind
 (20) Q Now were any immuno competence tests done on any of the
 (21) herring here?
 (22) A No that kind of test was not carried out
 (23) Q So when you talk about compromised to the immune
 systems
 (24) you re not talking about any immuno competency testing that s
 (25) been done to establish that hasn t happened?

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- (1) set up there I ll try to cure that in the future but if I
 (2) may walk this up to him
 (3) BY MR COOPER
 (4) Q This is one of the periodic publications by the Trustee
 (5) Council?
 (6) A That s correct
 (7) Q If you look on the - well you ve probably seen this one
 (8) before haven t you?
 (9) A Yes It was sent to me
 (10) Q If you look on page - well page 2 there is a piece there
 (11) entitled Study to Investigate Causes of Pacific Herring
 (12) Decline
 (13) A Yes I see that
 (14) Q Do you see the sentence fisheries biologists are unsure
 (15) if virus is causing the decline in herring returns or if it is
 (16) even the cause of the lesions?
 (17) A Yes I see that sentence
 (18) Q The theory that you propose establishes or proposes which
 (19) state that, in fact the virus is causing the decline in
 (20) herring isn t that right?
 (21) A That s the conclusion I ve come to that s right
 (22) Q A conclusion which at least as of May 1994 apparently
 (23) the Trustee Council for whom you ve been doing this work
 (24) doesn t agree?
 (25) A But I m a fish disease specialist and I have expertise in

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- (1) A No I m talking about immuno competency tests that had
 (2) been performed in fish including hydrocarbons that shows it
 (3) can be damaged following exposure
 (4) Q So there are tests that can be done but they haven t been
 (5) done in this case of Prince William Sound herring?
 (6) A Prince William Sound herring haven t specifically been
 (7) tested no
 (8) Q Have you explained this theory of yours to the Trustees
 (9) the Trustee Council?
 (10) A This theory that I have has been explained or discussed
 (11) amongst the herring group that I have worked with but not
 (12) specifically the Trustees
 (13) Q Isn t it in fact the case that the Trustees rather than
 (14) concluding that this theory that you have suggested is in
 (15) fact the case and that the oil spill is likely to blame for
 (16) the problems with the herring isn t it the fact that they have
 (17) concluded that they need more information and more studies in
 (18) order to figure out what happened to cause these low herring
 (19) runs in 1993 and 1994?
 (20) A I think more accurately that might be stated that they are
 (21) proposing to fund studies to confirm that the VHS virus has
 (22) indeed been responsible for the disease and the mortality in
 (23) the 93 and 94 run
 (24) Q Let me show you a document if I may DX9290
 (25) MR COOPER Your Honor I m sorry I don t have this

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- (1) this and they don t and the work they are doing is to confirm
 (2) what the cause is
 (3) Q Well let s talk about that for a minute Is there
 (4) something called an expression of interest?
 (5) A Yes
 (6) Q What is it?
 (7) A Depends on who expresses it
 (8) Q How about if the Trustee Council expresses it?
 (9) A Yes I m aware of what you re talking about
 (10) Q That s a document that basically is the Trustee Council
 (11) soliciting proposals from scientists to study something?
 (12) A That s correct
 (13) Q In fact they are not even soliciting a proposal with an
 (14) expression of interest what they are doing is soliciting
 (15) scientists to come back to them and say they have an interest
 (16) in developing a project to answer some questions?
 (17) A That s generally correct yes
 (18) Q Let me show you DX9276
 (19) This is the expression of interest that you thought I was
 (20) talking about isn t it?
 (21) A That s correct
 (22) Q This is something - you probably received this from the
 (23) Trustee Council?
 (24) A Yes
 (25) Q Did you have a hand in drafting it?

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- (1) A No
- (2) Q Have you responded with an expression of interest?
- (3) A I ve considered it but the response date is still at the end of this month and I ve been rather busy
- (4) Q I can t imagine on what
- (5) Q I can t imagine on what
- (6) But you recognize this as the expression of interest that came from the Trustee Council?
- (7) A Yes
- (8) Q Let s get the date on this When is - I don t know if this has a date on it but you received it fairly recently didn t you?
- (9) A Within the last month yes
- (10) Q And it asks for a response by I think - is it June 30th?
- (11) A I think that s correct
- (12) Q Oil Spill Trustee Council Expression of Interest it says Notice is hereby given that unpriced expressions of interest are being solicited by the Alaska Department of Fish & Game on behalf of the Exxon Valdez Oil Spill Trustee Council as the first step of a two step sealed proposal process to investigate why the pacific herring runs in Prince William Sound Alaska have failed for two years in a row
- (13) Now maybe I was wrong when I characterized this as a Trustee document Maybe it s both It s also from the Alaska Department of Fish & Game correct?
- (14) A Yes that states that in the first paragraph

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- (1) Q What they are doing is inviting scientists to come up with proposals of how they would go about trying to figure out what happened to cause the run to decline?
- (2) A That s correct
- (3) Q And they say in here it is not known whether VHSV was a primary or secondary pathogen Can you explain what a secondary pathogen is?
- (4) A Yes I can Secondary pathogen is one that takes advantage of an already diseased situation or a diseased individual in order to invade and grow and viruses don t do that ever
- (5) Viruses are primary pathogens
- (6) Q Then it goes onto say VHSV was also isolated from some adult herring in 1994 but the role of this virus remains uncertain
- (7) A That s what s stated
- (8) Q What they are saying they are not even certain if it s the virus that s causing the run decline?
- (9) A As it s stated there it sounds that way but what they - what I read is it s not been confirmed that the VHS virus has caused the -
- (10) Q Then they say -
- (11) A Wait I m not finished The role of the virus remains unclear What they are saying is it s not confirmed that the virus has caused the disease but based on all the available evidence from the VHS virus in Europe and from other fish

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- (1) species and from what I ve known to have this virus transpired since 1993 the possibility of it being the cause of this disease is extremely high
- (2) Q Well you re kind of ahead of the Fish & Game and the Trustee Council on that one aren t you?
- (3) A I may be
- (4) Q Because they are still uncertain?
- (5) A That s correct.
- (6) Q Even though they have had the benefit of your views?
- (7) A I haven t given them -
- (8) Q I thought you talked about this with the synthesis -
- (9) A This is with the synthesis committee on what may have caused the disease outbreak in 1993 and the decline of the fish populations but whether or not I talked to them about the things that have happened in the last three months or six months as a matter of fact we discussed this before the last three to six months
- (10) Q Well in any event, you re willing to tell the jury here and the rest of us that you think it s confirmed although the Trustee Council doesn t think so?
- (11) A No no I m saying the Trustee Council is asking for scientific confirmation from what appears to be a fairly obvious conclusion
- (12) Q Now they go on to say in here that No attempt has been made to test Koch s postulates for VHSV - and I m sure that

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- (1) all of us in this room know what Koch s postulates are but let me try and ask you this That s a way in which one can test to see if a virus is the cause of a disease Is that fair?
- (2) A In general Actually Koch s postulates were developed before anybody even realized viruses existed but if I may clarify
- (3) Q All right go ahead
- (4) A Basically a scientist a hundred or so years ago named Koch tried to devise a way to confirm that a particular microorganism was responsible for an observed disease like cholera or diphtheria and in order to do this he designed a series of protocols or stems one can take to confirm it.
- (5) And the first is you have to isolate this organism from the diseased animal and then you have to grow it in pure culture
- (6) And in his time since there were no viruses pure culture meant some sort of broth or blood or whatever they drew fungi or parasites in at the time Then it had to be isolated from that pure culture, just a single organism, I don t mean a single individual organism but a single species put it into a non-immune not previously affected animal and produce the very same disease that it had been isolated from but with none of the other associated organisms
- (7) Then it had to be reisolated again in pure culture
- (8) Now the slight variation to this theme in viruses is virus is dependent on living cells for their survival and growth So

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- (1) you can't grow them in pure culture. There has to be another
 (2) living cell. So Koch's postulate we've bent a tad to allow it
 (3) to go on in cell cultures.
 (4) Now if virus had been isolated from the disease or the
 (5) lesions of Prince William Sound herring and incidentally not
 (6) from adjacent skin that had no lesions but it was isolated
 (7) from the lesions it was put into cell culture and in the cell
 (8) culture it produced cell death, cell necrosis, indicative of
 (9) an infection of the cells by the virus and the cells did die.
 (10) The virus was taken back out of that cell culture and
 (11) introduced into non-immune fish and in these non-immune fish
 (12) it grew and multiplied and it was reisolated.
 (13) Q Doctor, are you talking about the Pacific herring VHSV?
 (14) A Yes, I am, and this was done at the U.S. Fish & Wildlife
 (15) Service in Seattle.
 (16) Q Talking about Myers?
 (17) A No, Jim Witson (ph), Fish & Wildlife virologist who
 (18) identified the indication of this virus.
 (19) Q Did Dr. Myers have a problem?
 (20) A Can you clarify what you mean?
 (21) Q A problem that prevented him from completing the Koch's
 (22) postulate test?
 (23) A There is one small glitch at this point in time and that
 (24) is that the species that the virus was reproduced following its
 (25) re-isolation was not a herring, it was a salmonid. I forgot what

0 15

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- (1) species and the reason for that is there at this time are no
 (2) known sources of VHS free or known non-exposed or herring
 (3) that have never been exposed to VHS so they couldn't
 (4) reintroduce it into the same species.
 (5) So consequently they used another species. This salmonid
 (6) species cannot develop that disease just as the European
 (7) doesn't produce the disease of the Northern America fish.
 (8) Q In any event, the Trustee Council wants, do they not a
 (9) proposal that will investigate anthropogenic and microbiology
 (10) causes of diseases affecting - anthropogenic means?
 (11) A Caused by humans.
 (12) Q And environmental?
 (13) A Things that would occur newly in the environment or
 (14) associated with the environment.
 (15) Q And microbial?
 (16) A That would be referring to microorganisms.
 (17) Q And nowhere in here you'll agree with me, I trust, does
 (18) the Trustee Council and ADF&G say, don't worry, we don't need
 (19) any of this stuff, we know it's the hydrocarbons that caused
 (20) the disease and the outbreak?
 (21) A No, That would be irresponsible on their part.
 (22) Q Why would that be irresponsible of them?
 (23) A Because strict confirmation has not been established and
 (24) that is what they are looking for. They want strict
 (25) confirmation in what's going on in Prince William Sound.

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- (1) Q That's because that's a requirement of science isn't it
 (2) Dr. Kocan?
 (3) A Yes, if you want an absolute answer that is a requirement
 (4) of science.
 (5) Q Well, if you want an answer that complies with the
 (6) standards of science?
 (7) A Yes.
 (8) Q Is that right?
 (9) A Yes, they are looking for confirmation. I agree to that
 (10) and I think they should.
 (11) Q And you're telling the jury here today that in fact the
 (12) hydrocarbons - you know the cause, it's the hydrocarbons
 (13) even though this scientific confirmation is lacking?
 (14) A I'm saying based on the information I have.
 (15) Q Can you answer that, yes or no?
 (16) A Yes, I'm saying that.
 (17) MR COOPER: I have no further questions, Your Honor.
 (18) THE COURT: Redirect?
 (19) REDIRECT EXAMINATION OF DR. RICHARD KOCAN
 (20) BY MR. JAMIN
 (21) Q Dr. Kocan, there is only a couple small things I want to
 (22) clarify. Let me just confirm, because when Mr. Cooper was
 (23) asking about your deposition - do you recall back in June of
 (24) 1993 being asked the question, do you have an opinion to a
 (25) reasonable degree of scientific certainty whether or not the

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- (1) Exxon Valdez oil spill and exposure to oil from that spill is
 (2) more probable than not an explanation for what occurred to the
 (3) herring population in Prince William Sound in 1993.
 (4) And giving the answer, based on all the studies I've
 (5) covered and my own studies and the available data and the
 (6) declining population, yes, I think there is a very good
 (7) possibility that the Valdez spill affected this and caused that
 (8) decline.
 (9) A Could you tell me from where you're reading that?
 (10) Q Your deposition in June 11 of 1993. Would you like to take
 (11) a look at it?
 (12) A Yes, please.
 (13) Yes, those are my words.
 (14) Q Do you understand that you support the Trustees' study to
 (15) look into confirmation of your opinion?
 (16) A Absolutely.
 (17) Q And are you able to give an opinion here in court today
 (18) that it is more probable than not that the virus is a function
 (19) of the Exxon Valdez oil spill?
 (20) A I would say that the ultimate disease resulting from that
 (21) virus is - has resulted from exposure - previous exposure to
 (22) oil.
 (23) Q So it's the disease itself?
 (24) A The disease, yes.
 (25) Q And what the Trustees are after then, through confirmation

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- (1) is a higher standard of proof than more probable than not is
 (2) that true?
 (3) A That s correct
 (4) Q Now one area of clarification There was some questions
 (5) regarding the effect on the different age classes and I wanted
 (6) to clarify that
 (7) Is it your view sir that when the 89s who were affected
 (8) by the virus and ultimately the disease when they came back
 (9) that they affected the 88 class?
 (10) A Would you restate that?
 (11) Q Certainly There was some questions about when the fish
 (12) came back in 1993 and then again in 1994 and you had
 (13) indicated
 (14) that the 89 year class was particularly susceptible to the
 (15) virus And I wanted to ask you whether the 88 year class
 (16) could have been affected by that process as well?
 (17) A By the process of exposure previous exposure to oil or by
 (18) exposure to the virus?
 (19) Q Let s take both Let s ask about previous exposure to the
 (20) oil first
 (21) A Well the 88 year class was present in Prince William
 (22) Sound at the time of the oil spill so their potential for
 (23) exposure to the oil was very high
 (24) Q And how would that 88 year class have been exposed to the
 (25) oil?
 (26) A They would have been exposed through ingestion of

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- (1) contaminated prey direct exposure to the oil were they have
 (2) been to be swimming in the area of the plume as the oil exited
 (3) the Sound They could have been exposed through exposure
 (4) to
 (5) contaminated particles when they were suspended from the
 (6) bottom Several variations of exposure
 (7) Q Where were those 88s living roughly a year after their
 (8) spawn?
 (9) A You mean when they are one year old?
 (10) Q Yes
 (11) A Well they are distributed all over Prince William Sound to
 (12) some degree There is a tendency for them to concentrate in
 (13) higher numbers in the southwest that would be Montague
 (14) channel
 (15) and down toward the Kenai Peninsula
 (16) Q Was that directly in the path of the spill sir?
 (17) A As I understand it that s correct
 (18) Q Now you raised another issue that I wanted to ask the
 (19) final question about When the 89s come back in I think you
 (20) first said they came back in a little bit in 92 more so in
 (21) 93 and more so in 94
 (22) Is there any mechanism by which the 88 year class is
 (23) affected by the diseased 89s at that stage, sir?
 (24) A Well they would already be a part of the spawning
 (25) population by the time the 89 year class entered the spawning
 (26) population and if they were involved in that initial spread of
 (27) the disease they would be contaminated or infected by the

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- (1) newly released viral particles and become infected
 (2) Q In addition to the newly released viral particles would
 (3) they be affected in which the biomass milk and ovarian fluids
 (4) would be released?
 (5) A That would be the route of exposure The spawning
 (6) activities is basically comprised of thousands of fish spawning
 (7) pretty much spontaneously and the body fluid release is all
 (8) around them and you can see that so they are contaminated
 (9) fluids
 (10) Q So that biomass is composed of a number of different age
 (11) class years?
 (12) A That s correct All of the spawning age classes are
 (13) present in that biomass
 (14) Q And when the virus is released from those diseased fish is
 (15) it specific to the age classes that it affects?
 (16) A It s specific - no it would more likely to infect those
 (17) fish that were previously unexposed and did not already carry
 (18) the virus
 (19) Q Would that have included the 88 in 1993?
 (20) A It could have been yes
 (21) THE COURT Thank you Dr Kocan You may step down
 (22) MR O NEILL Some more documents to admit
 (23) Plaintiffs offer 773 319 320 -
 (24) MR COOPER Excuse me Your Honor Are they
 (25) preadmits?

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- (1) MR O NEILL They are and they were agreed
 (2) MS ROBINSON There is one on the list that was not
 (3) agreed and that s 3652
 (4) MR O NEILL I m not that far yet but why don t you
 (5) come up here and you can look over my shoulder
 (6) I m sorry Plaintiffs offer the following exhibits and I
 (7) started with 773 319 320 321 322 323 324 325 326 327
 (8) 328 329 330 331 332 333, 334 337 775 338-A 338-B 339
 (9) 340 341 342 818 354 3650 3651 3654 3655 and 361 And
 (10) Plaintiffs Exhibits 399 400 401 402 403 404 3739 6029
 (11) 6030 6031 and Plaintiffs Exhibits 412 413 739 421 422
 (12) 423 425 426 427 428 429 and 430
 (13) MS ROBINSON Defendants have no objection
 (14) (Exhibits 773 319 320 321 322 323 324 325 326 327
 (15) 328 329 330 331 332 333 334 337 775 338-A 338-B 339
 (16) 340 341 342 818 354 3650, 3651 3654 3655 and 361 And
 (17) Plaintiffs Exhibits 399 400 401 402 403 404 3739 6029
 (18) 6030 6031 and Plaintiffs' Exhibits 412 413 739 421 422
 (19) 423 425 426 427 428 429 and 430 offered)
 (20) THE COURT Thank you The Plaintiffs exhibits
 (21) announced by Mr O'Neill are admitted
 (22) (Exhibits 773 319 320 321 322 323 324 325 326 327
 (23) 328 329 330 331 332 333 334 337 775 338-A 338-B 339
 (24) 340 341 342 818 354 3650 3651 3654 3655 and 361 And
 (25) Plaintiffs Exhibits 399 400 401 402 403 404 3739 6029

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- (1) 6030 6031 and Plaintiffs Exhibits 412 413 739 421 422
 (2) 423 425 426 427 428 429 and 430 received)
 (3) MR JAMIN Your Honor the next witness was Mr
 (4) Rosenthal Should we approach the bench?
 (5) (At side bar off the Record)
 (6) MR JAMIN Your Honor Plaintiffs call as their next
 (7) witness Mr Richard Rosenthal
 (8) THE CLERK Raise your right hand
 (9) (The Witness is Sworn)
 (10) THE CLERK Please be seated For the record sir
 (11) state your full name your address and spell your last name
 (12) THE WITNESS Yes I m Richard Rosenthal and the
 (13) last name is R O S E N T H A L and I live on Whitby Island in
 (14) the town of Langley Washington
 (15) DIRECT EXAMINATION OF RICHARD ROSENTHAL
 (16) BY MR JAMIN
 (17) Q Sir how are you employed?
 (18) A I m a marine biologist and a wildlife nature
 (19) cinematographer
 (20) Q Do you have a bachelor s and master s degree in
 (21) marine biology?
 (22) A Yes
 (23) Q Do you have your course work done for your Ph D ?
 (24) A Yes
 (25) Q Shortly after the oil spill did you have a chance to come

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- (1) to Prince William Sound?
 (2) A Yes I did
 (3) Q Did you do some filming at that time?
 (4) A Yes I was filming for three different groups that were
 (5) interested in the spill in Prince William Sound
 (6) Q What were those groups sir?
 (7) A That was for the PBS the Nova series and for the BBC for
 (8) a David Attenboro (ph) special called Trials of Life and it
 (9) was also for the State of Alaska Department of Fish & Game
 (10) Q Now do you have a short segment of the film that you took
 (11) today?
 (12) A Yes I do
 (13) Q Now I m going to ask you to put to the side your career as
 (14) a biologist and I think it was Jack Webb used to say just the
 (15) facts as you narrate and we re going to show the film to the
 (16) jury Give us some of the ideas of the place and time Those
 (17) are some of the facts that are relevant
 (18) A This is preExxon Valdez grounding 1982 83 working on a
 (19) series called Sea School for the State of Alaska This is
 (20) herring during 1990 as they aggregate prior to spawning And
 (21) this is an example of what the eggs look like when they are
 (22) deposited on the sea vegetation and on the seafloor like snow
 (23) is falling
 (24) This is an example from the air off of Montague Island in
 (25) Rocky Bay Port Chalmers showing the milk and the extent of it

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- (1) on the shoreline where millions of fish have aggregated to lay
 (2) their eggs
 (3) Q Take a moment for the next segment
 (4) A This is in Herring Bay in early May when I joined the
 (5) Alaska Department of Fish & Game team and we re 20 feet
 (6) underwater here on a high tide working on the seaweeds and
 (7) rocky surface And the dive partner there is employed by Fish
 (8) & Game as a diver and we re here filming oil that had been
 (9) deposited on the seaweed and on the rocks weeks after the
 (10) spill
 (11) Q The third segment?
 (12) A The third segment is the herring aggregated and laying
 (13) their eggs on the seaweeds and some of the other creatures
 (14) that are coming in to feed on them Fish & Game research led
 (15) by Evelyn Biggs Brown and state biologist Dennis
 (16) Blakenbeckler
 (17) surveying the amount of egg deposition
 (18) In this shot you can see how fragile the eggs are coming
 (19) off the seaweeds during a storm or a tidal change and eggs get
 (20) washed on the beach And at Rocky Bay we found oil on the
 (21) eggs
 (22) MR JAMIN All right, sir I would move for the
 (23) admission of Plaintiffs' 269
 (24) (Exhibit PX269 offered)
 (25) THE COURT This has been subject to an objection that
 I have ruled on and it may be admitted

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- (1) (Exhibit PX269 received)
 (2) MR JAMIN Thank you Mr Rosenthal The defense
 (3) counsel may have questions for you
 (4) CROSS EXAMINATION OF RICHARD ROSENTHAL
 (5) BY MR LYNCH
 (6) Q Mr Rosenthal I have two questions This film was in
 (7) three segments more or less The segment that showed the
 (8) oiled kelp?
 (9) A Yes with the diver
 (10) Q Yes You said you were at high tide about 20 feet down?
 (11) A Right
 (12) Q Is that an area that s exposed at lower tides?
 (13) A It s exposed at lower tides like all Prince William Sound
 (14) intertidals every six hours
 (15) Q Not all of Prince William Sound goes dry every time the
 (16) tide changes?
 (17) A It depends on the elevation
 (18) Q What I m trying to get is that an area that s exposed to
 (19) the air?
 (20) A Yes it is
 (21) Q And what was the date of the last segment?
 (22) A Which segment was that?
 (23) Q There were three segments one you were laying down a
 (24) transect and looking at it
 (25) A That s the first two weeks in May 1989 with the Alaska

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- (1) Department of Fish & Game research
 (2) MR LYNCH Thank you
 (3) MR JAMIN No redirect Mr Rosenthal Thank you very much
 (4) THE COURT Thank you Mr Rosenthal You may step down
 (5) MR O NEILL Plaintiffs call Steve Hughes
 (6) THE CLERK Raise your right hand
 (7) (The Witness Is Sworn)
 (8) THE CLERK Please be seated For the record sir
 (9) state your full name your address and spell your last name
 (10) THE WITNESS Steven Edward Hughes 4055 21st Avenue
 (11) West Seattle And my last name is spelled H U G H E S
 (12) DIRECT EXAMINATION OF STEVEN HUGHES
 (13) BY MR O NEILL
 (14) Q How old are you Mr Hughes?
 (15) A 49
 (16) Q What do you do for a living?
 (17) A I'm fisheries biologist and owner/vice-president of a
 (18) private fisheries company called Natural Resource Consultants
 (19) Q What college degrees do you have?
 (20) A Bachelor of science and master of science degrees in
 (21) biology and postgraduate work in fisheries population
 (22) dynamics
 (23) Q Have you ever fished?
 (24) A Yes I fished commercially to get through high school and

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- (1) composition and size composition?
 (2) A Yes along with a number of other species
 (3) Q In 1981 did you change job positions?
 (4) A That's correct
 (5) Q What did you begin doing in 1981?
 (6) A Well in 1981 I had an opportunity to quit the federal
 (7) service and go to work for the private industry and I elected
 (8) to do that and joined this private fisheries research firm
 (9) called Natural Resource Consultants in 1981 as a partner
 (10) Q And with Natural Resource Consultants have you consulted
 (11) on any fisheries projects?
 (12) A Yes That's my business
 (13) Q What kinds of things do you do?
 (14) A Most of my work is directly with fishing companies
 (15) processing companies individual fishermen individual
 (16) processors I work with a large number of financial institutes
 (17) that are lending money in the fishing business and I do a
 (18) substantial amount of work through fishing trade associations
 (19) with the management councils in Alaska and also the
 (20) management
 (21) councils off the west coast So I work quite a lot with state
 (22) and federal agencies in my scientific capacity
 (23) Q Have you done any work for Sea First Bank?
 (24) A Yes We typically do annual reports for Sea First Bank
 (25) which evaluate the status of Alaska fisheries their economics
 (26) their growth potential and areas where investment should be

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- (1) college during the late 50s and early 60s
 (2) Q And what was your first non-fishing job?
 (3) A When I completed my master's degree I was hired by the
 (4) Borough of Commercial Fisheries U S government
 (5) Department of
 (6) Interior as a fishery biologist in Seattle and I worked there
 (7) for 13 years
 (8) Q And what did you do there?
 (9) A I was - during that period I was primarily in charge of
 (10) groundfish and shellfish research in Alaska mostly the Bering
 (11) Sea and Gulf of Alaska regions During that period I spent an
 (12) average of about 135 days at sea per year I was the leader of
 (13) most of the federal research that was done in the offshore Gulf
 (14) of Alaska and Bering Sea regions
 (15) Q Have you ever been on fishery research voyages?
 (16) A Many times
 (17) Q While you were with the Borough of Commercial Fisheries
 (18) which became the National Marine Fisheries Service, did you do
 (19) any report work for them?
 (20) A Yes
 (21) Q Would you tell us about it?
 (22) A Like other scientists I was expected to publish scientific
 (23) results and I had I believe - I had 27 formal publications
 (24) during the 13 years I was there and these dealt primarily with
 (25) resources off Alaska and their management.
 (26) Q Have you done any work with regard to herring catch catch

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- (1) supported
 (2) Q And you're not an economist?
 (3) A That's correct
 (4) Q But in your work from 1981 to the present you do
 (5) investigative work with regard to what prices fish are actually
 (6) selling at?
 (7) A Absolutely
 (8) Q So you couldn't do forecasting but if you have to do
 (9) research into the area of what did fish sell at in '89 or where
 (10) did fish sell at in '89 what kind of prices that's research
 (11) you've regularly done?
 (12) A That's standard procedure in our business
 (13) Q Have you done any herring resource analysis or forecasting
 (14) for Sea First Bank or the National Bank of Alaska?
 (15) A Yes both We also do all the fisheries technical work for
 (16) the National Bank of Alaska, and of course that has included
 (17) herring
 (18) Q Have you ever done any work with the North Pacific Fishery
 (19) Management Council?
 (20) A Yes since their formation in 1977 I believe it was
 (21) Q Have you done any work outside the United States?
 (22) A Yes
 (23) Q Who have you done work for outside the United States?
 (24) A The main project I was involved on was with the World Bank
 (25) spent nine trips to north Africa, worked in the north Indian

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- (1) Ocean the Gulf of Adenoff (ph) the country of Somal doing
 (2) fishery resource and assessment work
 (3) Q You ve mentioned you have authored 27 scientific articles
 (4) What generally subject was that?
 (5) A They fall in the areas of fisheries resource assessment
 (6) how much is there in time and space and the yields that is
 (7) how much of each one of those resources could be taken in a
 (8) commercial fishery and sustain a population at a constant level
 (9) or near constant level Those are the basics that have gone
 (10) into my more scientific work and I would say that equal to
 (11) that, the other part of my work has been gear development
 (12) commercial fishing gear development and a whole series of
 (13) studies that have basically Americanized the fisheries in the
 (14) Bering Sea the Gulf of Alaska those that used to be foreign
 (15) caught are all American caught, and this has occurred during
 my
 (16) work and career
 (17) Q I want to ask you about some of your work for Natural
 (18) Resource Consultants In the course of your duties with
 (19) Natural Resource Consultants over the last 13 years have you
 (20) had an opportunity to analyze fishery losses?
 (21) A Yes on many occasions More than 200
 (22) Q And that includes both attempting to estimate what the lost
 (23) fish were and what their value would have been looking at
 (24) comparable fishery prices?
 (25) A That s exactly right

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- (1) Q Have you ever been qualified as an expert witness in a
 (2) federal or state court with regard to the subjects of foregone
 (3) harvest and foregone harvest values?
 (4) A Yes
 (5) Q How many times?
 (6) A I would say between 15 and 20 and that includes Seattle,
 (7) Portland Eugene, Honolulu and Alaska.
 (8) MR O NEILL We would offer Mr Hughes as an expert
 (9) in calculating foregone fishing harvest values and foregone -
 (10) foregone fish harvest and foregone fishing harvest values
 (11) MR COOPER No objection
 (12) THE COURT Thank you The witness is qualified
 (13) MR O NEILL Thank you Judge I was going to sit
 (14) down
 (15) BY MR O NEILL
 (16) Q You weren t here to testify - so we can focus on herring
 (17) is that correct?
 (18) A That s correct.
 (19) Q What did you do to prepare yourself to come in here and
 (20) testify about herring?
 (21) A We evaluated Alaska Department of Fish & Game records for
 (22) many years from all the commercial fishing areas in Alaska for
 (23) herring We evaluated past years catches past years harvest
 (24) guidelines which is Alaska Department of Fish & Game s
 (25) projection of how much fish can be caught in the coming

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- (1) season We evaluated the catch composition of herring from
 (2) different fisheries that are broken down into age classes
 (3) which tells us the strength of the different year classes of
 (4) herring that support the fisheries We looked at how they
 (5) grow how they die We looked at information that supplements
 (6) my own experience on herring distributions where they occur
 (7) whether it be off shore in the Gulf of Alaska or Bering Sea or
 (8) in shore at different times of their lives We evaluated
 (9) prices that were paid to fishermen for herring in 1989 as well
 (10) as 1993 and 1994 I think that generally covers it.
 (11) Q Would you give us a little bit of background if you would
 (12) on the history and geographical extent of herring fisheries in
 (13) Alaska?
 (14) A Yes The commercial fisheries for herring typically start
 (15) in the Kah Shakes area That s down in southeast Alaska They
 (16) extend into several inland areas of southeast Alaska, not on
 (17) the coast but inside waters The next region to the north -
 (18) I ve got to get this right here Is this the marking pen?
 (19) Q Yeah I m just trying to see if I can -
 (20) THE COURT It s a black thing
 (21) THE WITNESS I can explain
 (22) The commercial fisheries start in southeast Alaska in the
 (23) Kah Shakes area in March and they progress to the north as
 (24) winter turns to spring and the water warms This is a
 (25) time-dependent temperature-dependent succession We call
 this

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- (1) the herring circuit.
 (2) So we proceed from southeast Alaska to Prince William
 (3) Sound Next to Cook Inlet. Next to Kodiak Following that
 (4) is on the south side of the Alaska Peninsula, including the
 (5) Chignik area There is a food and bait fishery to the west in
 (6) the Dutch Harbor area That s at the end of Unalaska Island
 (7) and in Unimak Pass area
 (8) There is an area fishery at Port Moller which is on the
 (9) north side of the Alaska Peninsula about halfway into Bristol
 (10) Bay There is a large herring fishery in Togiak which is in
 (11) the northern part of Bristol Bay There are several smaller
 (12) ones in Goodnews Bay Security Cove and working up in
 passed
 (13) the Kuskokwim area to Norton Sound
 (14) In all there is more than 30 commercial herring fisheries
 (15) by area and gear type
 (16) Q I want to go for a minute to the Alaska Department of Fish
 (17) & Game management or the so-called sustained yield concept
 or
 (18) basis
 (19) A Yes
 (20) Q Would you tell them about that?
 (21) A This is a basic simple principle in fish management that we
 (22) all try to achieve and Fish & Game adopted this awhile ago
 (23) What it s based on is determining a population size they call
 (24) it a biomass Usually that biomass pertains to adults that
 (25) were recruited to the fishery that are likely to be caught

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- (1) They do through different techniques an assessment of that
 (2) population to determine the magnitude of that measured in
 (3) tons
 (4) In the case of herring that is done as the first - the
 (5) first time it's done in the cycle is after the fish spawn and
 (6) they do an egg deposition survey and there is a quantitative
 (7) relationship between egg density and number of females that
 (8) have spawned and from that they calculate a biomass estimate
 (9) for the total stock males and females That occurs in the
 (10) Prince William Sound and other areas affected here basically
 (11) during April
 (12) After that the fish move off shore and when they come
 (13) back the next year Alaska Department of Fish & Game has an
 (14) opportunity to aerial survey this returning stock and again
 (15) obtain a separate estimate by aerial survey to determine how
 (16) large that source is compared to what they project it to be
 (17) The projections are also influenced by the age of the
 (18) herring As I mentioned they have information on how fast
 (19) four year olds grow and how fast they die and how fast five
 (20) year olds grow and how fast they die It's a difference it's
 (21) a dynamic process They add these up make a projection what
 (22) the biomass is going to be
 (23) Alaska Department of Fish & Game has a very strict and
 (24) simple management formula For herring in Prince William
 (25) Sound if there is more than 8400 tons of biomass available

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- (1) they can allow a fishery And if there is more than 42 500
 (2) tons assessed to be there they only harvest at a rate of 20
 (3) percent That's their goal 20 percent
 (4) So between 8400 tons and 42 500 tons there is a sliding
 (5) scale of zero to 20 percent but as long as it's over 42 000
 (6) tons they harvest at a rate of 20 percent So essentially if
 (7) they know what their biomass is they then establish what they
 (8) call this final guideline harvest based on a percentage of
 (9) that and that becomes the catch quota what the fishermen are
 (10) likely to take
 (11) Q Now Mr Parker came in here and testified about the 1989
 (12) closures herring closures that were a result of the oil
 (13) spill and Dr Kocan came in here and - there were herring
 (14) failures in 1993 and 1994?
 (15) A There were failures in herring biomass and the fishery
 (16) Q And he testified about causation the relationship of the
 (17) spill to the 1993 and 1994 herring failures
 (18) A Yes
 (19) Q You're here today to put a number on the foregone harvest
 (20) for 1989 and 1993 and 1994 for herring?
 (21) A That's exactly what I'm here for
 (22) Q I just wanted to put your testimony into relationship with
 (23) everybody else so we know what you're testifying about and
 (24) what you're not
 (25) A Thank you

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- (1) Q Now in 1989 the testimony has been that all of the 1989
 (2) sac-roe fisheries in Prince William Sound were closed for the
 (3) season Are you aware of that?
 (4) A That's correct
 (5) Q Now let's see if we can do some lost harvest calculations
 (6) for each of the Prince William Sound herring fisheries and I'm
 (7) going to bring up Exhibit 399 which is in evidence and ask
 (8) you if that helps
 (9) Do you want to use any particular part of it? We can bring
 (10) up parts make it a little easier to read
 (11) A Yes I think what we should do is pull up the top half
 (12) please
 (13) In Prince William Sound in 1989 there were four commercial
 (14) fisheries that were impacted by the oil spill These are the
 (15) purse seine sac-roe fishery the gillnet sac-roe fishery the
 (16) pound fishery and the wild roe on kelp fishery And what I
 (17) would like to do is share with you how we went through and
 (18) evaluated each one of these and the decisions we made on
 (19) what
 (20) the forgone harvests were
 (21) So in the case of the purse - excuse me the purse seine
 (22) fishery you should realize this is a very very intense
 (23) fishery It's very intense it's very short There is a lot
 (24) of vessels seeking herring in a short period of time Alaska
 (25) Department of Fish & Game always tries to achieve their
 guideline harvest level which is that area right here

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- (1) Q You've got the color on up there?
 (2) A Let's see color on got it
 (3) Q Now if you don't goof it up we'll do okay
 (4) Good work
 (5) A Between 1984 and 1991 we've put this information together
 (6) for you which documents first of all for these years the
 (7) forecasted biomass for herring the guideline harvest for
 (8) herring the actual harvest that occurred and what percentage
 (9) the harvest was of the forecasted biomass
 (10) Q When we talk about biomass instead of talking about fish
 (11) we're just talking about tons?
 (12) A That's correct, tons of herring What I want to emphasize
 (13) to you is that our job to be fair and objective to try and
 (14) figure out what the loss was required that we choose from past
 (15) years or pick a year that are most representative of the
 (16) fishery that would have occurred in 1989 And so in
 (17) forecasting what the loss of harvest was for 1989 Prince
 (18) William Sound purse seine fishery we used the average of the
 (19) 1984 to 1990 experience and the reason is that those forecast
 (20) biomasses were most closely representative to the 54 899 tons
 (21) that was forecasted for 1989
 (22) Q What we're doing is we're going to average 1984 to 1990 and
 (23) figure out what the average mass of fish was?
 (24) A That's correct. So the bottom line is that for 1984
 (25) through 1990 the purse seine fishery accounted for 16 67

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- (1) percent of the forecasted biomass We then applied that with
 (2) the - to the forecasted biomass for 1989 Prince William Sound
 (3) resulting in a projected harvest of 9 150 tons
 (4) Now I mentioned to you earlier that in ADF&G's attempt to
 (5) hit a guideline harvest they often overrun that in the actual
 (6) harvest. That's not a problem because they are only
 (7) exploiting at a 20 percent rate which is very conservative
 (8) So I want you to understand that while they don't hit the
 (9) guideline harvest they exceed that by a certain amount We
 (10) took that history into account and said it's going to be the
 (11) same for 1989 as it has been in the past years
 (12) Q So in simple terms the 1989 projection for this particular
 (13) gear type purse seiners and we saw one you did two averages
 (14) and came up with a projection that is based on two averages
 (15) that span the years from 1984 to 1990?
 (16) A That's very close and we settled on 16.67 percent of the
 (17) forecast biomasses being most representative of what would
 (18) have
 (19) occurred had there not been an oil spill in Prince William
 (20) Sound in 1989
 (21) Q And then you applied that percentage to what the forecasted
 (22) biomass was and you came up with 9 150 tons?
 (23) A For the purse seine fishery that's correct.
 (24) Q Now I want to go to the next gear type There are purse
 (25) seiners and then there are also gillnetters That's another
 (26) collection of fishermen?

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- (1) A That's correct So if we pull the bottom half of the
 (2) screen-
 (3) Q I didn't do it very well Give me another try And the
 (4) color should be on for you
 (5) A Thank you We went through exactly the same process here
 (6) with the gillnetters The same years were considered Here is
 (7) the same forecasted biomass numbers The gillnet experience
 (8) in
 (9) this fishery during 1984 to 1990 was 1.01 percent so a much
 (10) smaller component of the operation but the experience was
 (11) they
 (12) accounted for just over one percent So again going through
 (13) the calculations had they been able to fish as anticipated, we
 (14) projected they would have caught 556 tons of herring This is
 (15) the bottom line right here Okay?
 (16) Q Now I want to go to the other two types of herring fishers
 (17) in Prince William Sound and they are on Exhibit Plaintiffs
 (18) 400 which has been admitted and let me bring up the top half
 (19) of Plaintiffs 400
 (20) Tell me about it
 (21) A Again this is the wild roe on kelp fishery and here it
 (22) was necessary for you to change the years that were
 (23) considered
 (24) in the average Here again for you we have the forecasted
 (25) biomass that we talked about earlier for the period 1984
 (26) through 1991 but the fact of the matter is that this fishery
 (27) called wild roe on kelp has been subject to several types of
 (28) changes during the 1984 to 1991 period We had to be
 (29) sensitive

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- (1) to those changes and we had to pick years that most carefully
 (2) matched the management regimes and what was going to
 (3) occur in
 (4) 1989
 (5) Those years in this instance were 1987 through 1990
 (6) This fishery accounted for 1.89 percent of the total herring
 (7) catch - of the total forecasted biomass rather and that is
 (8) equivalent to 130 tons of roe on kelp Okay?
 (9) Q And with regard to the last type of herring fisher in
 (10) Prince William Sound?
 (11) A This is called the pound roe on kelp fishery This is the
 (12) fourth fishery that occurred in the Sound and suffered losses
 (13) This is kind of an interesting fishery What happens here is
 (14) the same purse seine vessels that may be involved in the seine
 (15) roe fishery capture herring They very carefully transfer
 (16) those herring into a floating pen called a transfer pound
 (17) That pound is moved to the permanent pound and the herring
 (18) are
 (19) transferred to the permanent pound and they are held there and
 (20) they spawn on kelp that is laid in that pound
 (21) After the spawning occurs and the herring are released
 (22) over time those kelp fronds are harvested And so once again
 (23) we're going through exactly the same process
 (24) I should tell you that Alaska Department of Fish & Game has
 (25) changed their management of this fishery during the late 1980s
 (26) and early 1990s to better control the harvest The problem
 (27) here was that in many years they overshot the harvest that they

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- (1) were allocated and in other years they undershot it.
 (2) ADF&G instituted policy changes that occurred during this
 (3) period to try to achieve the guideline harvest that were
 (4) projected more closely Those years that most closely
 (5) approximated what would have occurred in 1989 was the period
 (6) 1988 and 1990 We took the average of those years They
 (7) represented just over 3 percent of the forecasted biomass and
 (8) the projection of loss was 134 tons of pound roe on kelp
 (9) Q So now we've estimated at least by ton what the foregone
 (10) harvest was for Prince William Sound in 1989?
 (11) A That's correct.
 (12) Q Now I want to go to Lower Cook Inlet, and I'm going to use
 (13) Plaintiffs' Exhibit 401 which is in evidence
 (14) Now in Lower Cook Inlet the testimony has been that the
 (15) outer and eastern districts were closed and that they were -
 (16) they are normally managed as an exploratory fishery during
 (17) normal years Is that your understanding?
 (18) A That's - in general terms that's correct.
 (19) Q With regard to Exhibit 401 which is in evidence will you
 (20) tell us what you did to estimate the impact of the Exxon Valdez
 (21) oil spill on the Lower Cook Inlet herring fishery?
 (22) A This one is going to be more difficult to read I'd like
 (23) to tell you that in Lower Cook Inlet it's a much smaller
 (24) fishery and Alaska Department of Fish & Game does not
 (25) conduct
 (26) the research in this area that they do in Prince William Sound

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- (1) so there is more limited information to deal with
 (2) So what we did in this area was we basically looked at the
 (3) guideline harvest levels that have been assigned to this region
 (4) for many years and you can see those are consistent at 350
 (5) tons for both the eastern district and the outer district and
 (6) here we have -
 (7) Q Do you want a colored pen? Let me bring it up again just
 (8) a second
 (9) A This area is divided into two subdistricts so we had to
 (10) treat each subdistrict separately but we looked at the history
 (11) of the guideline harvest levels looked at the performance of
 (12) the fishery took the average for the most representative
 (13) years and the bottom line losses were calculated at 239 tons
 (14) in round numbers for the eastern district and at 75 tons in
 (15) round numbers for the outer district
 (16) So this was our conclusion of the foregone harvest of
 (17) herring in this small fishery just to the north of Prince
 (18) William Sound
 (19) Q Now in addition to Lower Cook Inlet the Exxon Valdez had
 (20) an impact on the Kodiak herring fishery Would you describe
 (21) that to us?
 (22) A Yes The Kodiak area is a large area There is herring
 (23) that occur in more than 50 separate bays in Kodiak and Alaska
 (24) Department of Fish & Game considers each one of these to be a
 (25) separate stock of herring So each one of these bays is a

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- (1) sign - a guideline harvest level if they have that
 (2) information
 (3) Now the Kodiak fishery was interrupted in some areas and
 (4) not interrupted in others So what we did was we went through
 (5) each one of these 50 years We looked at the histories that
 (6) have occurred in these areas We calculated what the catch
 (7) would have been relative to the experience in these areas and
 (8) the guideline harvest levels for 1989 we subtracted out the
 (9) areas that actually had catches and we arrived at a bottom
 (10) line loss of harvest for 1989 for two gear types sac-roe purse
 (11) seine and sac roe gillnet They do not have the wild roe on
 (12) kelp nor the pound fishery
 (13) So from the standpoint of losses it was simpler We only
 (14) had two gear types to deal with
 (15) Q And I put on the Elmo Exhibit 402 and with your help tell
 (16) me - can we deal with this section first?
 (17) A The Kodiak area has what's called guideline harvest areas
 (18) where they have made a forecast of what the harvest will be
 (19) and they also have exploratory areas which are open that do
 (20) not have a set quota So for the 1989 guideline harvest areas the
 (21) spawning biomass was forecasted to be about 9500 tons
 (22) There
 (23) was a preseason guideline harvest set of just over 2400 tons
 (24) The inseason guideline harvest that was available to the
 (25) fishery and that comes from the areas that were open totaled
 1897 tons and the actual harvest rather than being the 2400

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- (1) ton guideline was actually 2113 tons
 (2) Now in that year the history in Kodiak was that they
 (3) slightly exceeded the guideline harvest levels which is not
 (4) uncommon They took about 111 percent So we applied that
 to
 (5) the areas that were lost and projected a foregone harvest that
 (6) totaled 577 tons And that then was split between purse seine
 (7) vessels and gillnet vessels based on their traditional
 (8) participation in that fishery
 (9) Then we have the exploratory areas below These are areas
 (10) where there is not actually a guideline harvest predetermined
 (11) but they are open for fishing and some of these areas were
 (12) affected by oil and some were not And we calculated that
 (13) those areas affected by oil resulted in a loss of catch of 120
 (14) tons all in the same process that we went through in the other
 (15) bays And then again we divided that between purse seine and
 (16) gillnet assigning 108 tons to purse seine and 12 to gillnet
 (17) Q And then on the bottom of Exhibit 403 there is a summary?
 (18) A There is a summary For the Kodiak area both the
 (19) exploratory and guideline harvest together we calculated the
 (20) loss at 697 tons and below that it's divided between the gear
 (21) types
 (22) Q And we've now calculated the tons and on Exhibit 404 we
 (23) have a summary of the 1989 foregone herring losses for Prince
 (24) William Sound Kodiak Lower Cook Inlet and - what is the
 (25) outer district purse seine sac-roe?

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- (1) A That's part of Lower Cook Inlet
 (2) Q So we've gone through these four fishing areas and these
 (3) are the summaries of the foregone harvests in the next to the
 (4) right column on Exhibit Number 404 is that correct?
 (5) A Yes This is simply a summary of what we've just gone
 (6) through for the different fisheries and the different areas
 (7) Q And did you attempt to place a value on all of this herring
 (8) that wasn't caught?
 (9) A We did
 (10) Q And how did you do that?
 (11) A For 1989 for Kodiak where there was some fishing that
 (12) took place and for Cook Inlet where there was also some
 (13) fishing that took place we used the average grounds price
 (14) That was price that was paid by processors to fishermen for
 (15) catches that actually occurred that year in those areas And
 (16) for Prince William Sound where there was no fishery we used
 (17) the Exxon Valdez grounds price
 (18) Q The Exxon claims payment grounds price?
 (19) A That's correct. The grounds price that was established by
 (20) the Exxon payment office
 (21) Q And does Exhibit 405-A reflect both the foregone harvest
 (22) tons and the 1989 prices that you are using to estimate the
 (23) foregone harvest value and summarize those?
 (24) A Yes
 (25) MR O NEILL. We would offer 405 Alpha

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- (1) (Exhibit 405-A offered)
 (2) MR COOPER No objection
 (3) THE COURT Plaintiffs Exhibit 405-A is admitted
 (4) (Exhibit 405 A received)
 (5) BY MR O NEILL
 (6) Q Is it your opinion with regard to Prince William Sound
 (7) Kodiak and Cook Inlet that the fishermen because of those
 (8) areas - because of the spill lost \$16 670 700?
 (9) A That s my opinion
 (10) Q I want to if we could go to the year 1993 -
 (11) MR O NEILL. It s noon time
 (12) THE COURT We ll take our second recess We ll be in
 (13) recess for 15 minutes
 (14) (Jury out at 12 00)
 (15) (Recess at 12 00)
 (16) (Jury in at 12 20)
 (17) THE CLERK. All rise
 (18) BY MR O NEILL
 (19) Q I want to move to 1993 and 1994 but just by way of
 (20) clarification before I do that with regard to the reasons for
 (21) the 1993 and 1994 failure Dr Kocan testified to those?
 (22) A That is correct
 (23) Q And you re here and were asked to do a calculation as to
 (24) what the harvest would have been had there been seasons in
 (25) 1993
 (25) and 94?

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- (1) A That s correct
 (2) Q Plaintiffs Exhibit - well what did you take a look at
 (3) with regard to the foregone harvest estimate for 1993 for
 (4) Prince William Sound?
 (5) A We basically went through the same process we went
 through
 (6) in 1989 looked at all the same information Looked at Alaska
 (7) Department of Fish & Game s forecasted spawning biomass for
 (8) 1993 In round numbers that was about 134 000 tons of
 (9) herring It was projected to be a big year
 (10) Q Plaintiffs Exhibit 6029 which has been admitted into
 (11) evidence is 6029 your calculation of lost biomass for 1993?
 (12) A It is for two gear types purse seine and gillnet.
 (13) Q I ll bring up the second page in a minute Let s do the
 (14) purse seine first Would you tell us what you did in Exhibit
 (15) 6029 with regard to calculating the foregone harvest of purse
 (16) seine herring biomass in Prince William Sound for 1993?
 (17) A Yes I mentioned to you earlier that Alaska Department of
 (18) Fish & Game had made some changes in some of their
 management
 (19) techniques but in 1993 we still lived under two important
 (20) principles The 8400 threshold biomass was still in place and
 (21) the 42 000 threshold biomass was still in place So everyone
 (22) expected that Prince William Sound would be harvested in 1993
 (23) at the 20 percent exploitation rate That was what was
 (24) forecasted
 (25) What we did in the way of background because the harvest

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- (1) for 1993 was projected to be a large harvest very close to
 (2) what it was in 1991 and 1992 and because of the intensity of
 (3) the fishery I mentioned that Alaska Department of Fish & Game
 (4) has a tougher time managing fisheries when the harvest is
 (5) small because they have the same number of boats as when
 the
 (6) harvest is larger so we used the two most similar years which
 (7) was 1991 and 1992 That s why we used those years they
 mostly
 (8) represented what we expected to happen in 1993
 (9) The bottom line is that there was a very substantial
 (10) reduction in biomass that showed up Instead of 134 000 metric
 (11) tons that was expected there was about 30 000 tons that
 showed
 (12) up Nearly a hundred thousand tons was missing As a result
 (13) the largest fishery, the sac-roe purse seine fishery was not
 (14) allowed to operate Using the same procedures I explained
 (15) before, we calculated that loss at 17 400 metric tons in round
 (16) numbers and that was what we did for purse seine
 (17) The gillnet fishery was allowed to operate We had
 (18) operated in 1991 and 1992 just as the seiners had They had
 (19) the same experience The bottom line was their loss we figured
 (20) was negligible We assigned no loss to that gear type for
 (21) 1993
 (22) Q I want to bring you to the next page of Plaintiffs 6029
 (23) which has been admitted and what is the second page of the
 (24) second page of Plaintiffs 6029?
 (25) A This is the foregone harvest calculations for the other two

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- (1) fisheries the wild roe on kelp fisheries and the pound
 (2) fisheries and we will go through these
 (3) Q Yes sir
 (4) A The wild spawn on kelp fishery also operated but it
 (5) operated in a constrained manner because the biomass was not
 (6) there to support the fishery as expected So in this case we
 (7) have a - an experience where Alaska Department of Fish &
 Game
 (8) had basically tightened up their regulations and they were
 (9) effectively managing this fishery to achieve a guideline
 (10) harvest. We assumed that had there not been a problem with
 the
 (11) biomass in 1993 they would have achieved what Alaska
 (12) Department of Fish & Game had allocated them That guideline
 (13) harvest was 268 tons
 (14) Q And they didn t catch that much?
 (15) A That s correct They actually took 163 tons of product
 (16) We simply subtracted what they were allocated less what they
 (17) did take and calculated the foregone harvest to be 105 000
 (18) tons of product. That concluded the wild spawn on kelp
 (19) fishery
 (20) Q What did you do with regard to pound roe on kelp?
 (21) A Now the other thing that occurred was that in actually
 (22) 1991 and later in 1992 for this fishery ADF&G was continuing
 (23) to change some of the regulations on how this fishery was
 (24) managed They were having problems measuring how much
 herring
 (25) was actually put into these pounds because you can t take the

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- (1) herring out of the water and weigh them and then put them in
 (2) the pounds because the herring die So when a seiner comes
 up
 (3) alongside a pound and he s going to transfer the contents of
 (4) his net into the pound it s at best an estimate of how much
 (5) fish has gone into that pound
 (6) And that was creating some of the problems that ADF&G was
 (7) having in managing this fishery and it accounts for a lot of
 (8) the variation why they didn t achieve a guideline harvest or
 (9) got too much
 (10) So what they did and this applied in 1993 they changed
 (11) this to be a regulation that was based on the number of kelp
 (12) leaves or fronds that are put into these pounds They simply
 (13) said we re not going to allow more 1950 leaves per pound
 (14) We checked with Prince William Sound processors those
 (15) people that account for about 80 percent of the purchase of
 (16) this product They were expecting a yield of 3 pounds per
 (17) leaf That s the weight of the leaf plus the roe that s on the
 (18) leaf And from that and knowing that there were 126 pounds
 (19) that were in place that year to operate we calculated what the
 (20) harvest would have been had there been fish there to support
 as
 (21) planned We subtracted the actual catch which was 98 tons
 (22) and the difference was 207 tons of product that was lost That
 (23) was our method
 (24) Q So using these four methods you were able to come up with
 (25) the lost biomass the biomass that was not harvested because
 of

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- (1) the failure of the 1993 season?
 (2) A I wouldn t say it quite that way We were I believe to
 (3) come up with the products that should have been caught or the
 (4) herring or the roe with kelp that should have been harvested
 (5) but was not because of the failure in a very substantial part
 (6) of that biomass to return support to the fishery as planned
 (7) Q Did you attempt to put a dollar value on that?
 (8) A We did
 (9) Q What dollar values did you look at with regard to the 1993
 (10) season?
 (11) A For the 1993 seasons in Prince William Sound we - as I
 (12) indicated earlier we checked with pounders We talked to
 (13) other processors that purchased wild roe on kelp and we
 (14) talked
 (15) to fishermen that had planned to seine and had agreed on
 prices
 (16) or what they were to receive for herring We also checked
 (17) with - I m sorry We also checked with Alaska Department of
 (18) Fish & Game and we got prices for the adjacent areas for the
 (19) sac-roe seine fishery from Sitka and from - I think it was
 Cook Inlet
 (20) So we did basically everything we could to check adjacent
 (21) area prices same fish same roe content We used actual
 (22) prices where we could and we applied those to the foregone
 (23) loss
 (24) Q And I have in front of you Exhibit Number 3738 Plaintiffs
 (25) 3738 Is that a summary both of the foregone harvest in tons

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- (1) and the prices that you looked at?
 (2) A Yes I think if we blow that up -
 (3) MR O NEILL Before we do I ll offer Exhibit 3738
 (4) (Exhibit 3738 offered)
 (5) MR COOPER No objection
 (6) THE COURT Plaintiffs 3738 is admitted
 (7) (Exhibit 3738 received)
 (8) BY MR O NEILL
 (9) Q Will you tell us what is contained in Exhibit 3738?
 (10) A Again this is for Prince William Sound 1993 foregone
 (11) harvest or identified in short tons by the three fisheries that
 (12) were impacted I mentioned that we assigned no loss to the
 (13) gillnet fishery so we only have three fisheries here The
 (14) price per ton that was assigned to those products is indicated
 (15) in the second column and the lost values are a simple matter
 (16) of multiplication which are in the 1993 lost value category
 (17) totaling just over 15 million dollars
 (18) Q Does Exhibit 3738 which is in evidence reflect your best
 (19) estimate of the lost herring harvest and value in 1993 in
 (20) Prince William Sound?
 (21) A It does
 (22) Q I d like to go to 1994 and I ll sit down this is
 (23) testimony is a little tedious
 (24) Let me ask you a question Do people actually eat those
 (25) kelp - do you eat the kelp with the fish eggs on it? Have you

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- (1) ever eaten it?
 (2) A Yes
 (3) Q You did?
 (4) A Of course
 (5) Q I don t believe you
 (6) A That s my attorney
 (7) Q I just can t believe it.
 (8) Let s go to Plaintiffs Exhibit 6030 which is in
 (9) evidence And what is 6030 sir?
 (10) A 6030 is a summary of our analysis of the 1994 loss in
 (11) Prince William Sound
 (12) Q Tell us how you did it
 (13) A This is a little bit more complicated but not very much
 (14) What we were faced with in projecting the loss for 1994 was the
 (15) fact that Alaska Department of Fish & Game in 1993 was not
 able
 (16) to do a spawn survey deposition so we didn t have the base
 (17) line of biomass that occurred in the - after spawning in the
 (18) spring of 1993 to project what was likely to be there for
 (19) 1994
 (20) So what we had to do was two things First of all we had
 (21) to go back to the spawn deposition survey that last occurred
 (22) That was after spawning in 1992 That was the spawn
 deposition
 (23) survey that was used to forecast the 134 000 tons of herring
 (24) that was projected to arrive in 1993 We took that number and
 (25) then we assumed that the natural mortality losses of herring

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- (1) which Dr Kocan has discussed with you would be offset between
- (2) 1993 and 1994 by the growth of the year classes that would occur in this fishery
- (3) I want you to appreciate that in 1994 that fishery would have been supported to a very large extent by the 1988 year class of fish These fish have now grown to the point that they are six years old They were supporting this fishery in 1994 to the tune of about 80 percent of the total harvest
- (4) Eight out of ten of those fish taken in the 1994 fishery had there been one would have been projected to have been from that 1988 important year class
- (5) And I think you understand that in Prince William Sound for more than 20 years now there has been a predominant year class every four years so the big year classes have been in the 80s 1980 1984 1988 The next one would be the 1992 year class which is not there yet to support the fishery
- (6) So we knowing the growth rates of that year class and the natural mortality rates assume that losses due to natural mortality would offset growth of that fish and that's a valid assumption
- (7) What we then did was we said in 1993 there was projected to be a spawning biomass of 134 133 tons and if I have the color on that's right here Now we know that in 1993 we didn't have the full harvest that we expected but we assumed that if you would have had the full harvest there would have

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- (1) been more fish taken out of the system than what there really was And the full harvest had there not been a problem is 21 600 tons So we subtracted that and we said that if 1993 would have been normal and 1994 would have been normal we would have had a forecasted biomass of herring in Prince William Sound that's 112 500 pounds in round numbers
- (2) In 1994 Alaska Department of Fish & Game made one more change in management They changed the threshold biomass levels They said we're going to change this if there is more than 20 000 tons of herring that shows up in 1994 - I'm sorry They said if there is more than 22 000 tons of herring that shows up in 1994 we're going to allow a commercial fishery at a 20 percent exploitation rate
- (3) Well when the date came and the herring came in and the surveys were done there was a maximum of 20 000 tons of herring that showed up There was no commercial fishery allowed
- (4) Q Not enough fish for a commercial fishery?
- (5) A None So that year was a loss and it was a loss largely because of the failure of that 1988 and successive year classes
- (6) Q And did you go through the same drill with regard to the four types of gear types to compute a foregone harvest of the year 1994 for Prince William Sound?
- (7) A We did we went through the same drill

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- (1) Q And I have in front of you Plaintiffs Exhibit 6031 which is in evidence and I'll pull up the top half of the page of 6031 And would you explain to us very very briefly what you did?
- (2) A We did the same thing we did here for 1993 You'll probably recall that the purse seiners were accounting for 13 percent of the forecasted biomass in 1991 1992 and we used that same number for 1993 We again applied that same number for 1994 and projected 14 624 tons of foregone harvest
- (3) Q Let's be merciful to all of us Did you go ahead and apply the same kinds of processes that you used for 1993 to the 1994 numbers for the other three gear types?
- (4) A Exactly the same
- (5) Q As a result of that did you come up with a total foregone harvest?
- (6) A We did
- (7) Q And did you take a look at what the 1994 prices were in comparable areas and other price information for 1994?
- (8) A We run through the same drill we went through for 1993 We talked to processors fishermen Alaska Department of Fish & Game looked at prices in adjacent areas and made our decisions based on what we considered to be the best information
- (9) Q And I have placed in front of you Plaintiffs Exhibit 3777 for identification That a summary of that information for

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- (1) 1994?
- (2) A Yes it is
- (3) MR O NEILL Offer Plaintiffs' 3777
- (4) (Exhibit 3777 offered)
- (5) MR COOPER No objection
- (6) THE COURT Plaintiffs 3777 is admitted
- (7) (Exhibit 3777 received)
- (8) BY MR O NEILL
- (9) Q And taking a look at Plaintiffs 3777 the middle part of Plaintiffs 3777 7777* could you tell us what you got there?
- (10) A Well we assigned prices for the purse seine sac-roe That's what you're referring to the middle part
- (11) Q Is a summary of the -
- (12) A Yes It's done by the four gear types totals \$21 7 million
- (13) Q Would you tell us where you got the prices for 1994?
- (14) A Yes Again the same We checked with Prince William Sound processors fishermen and adjacent area prices that were actually realized
- (15) Q With regard to the 1989 foregone harvest exhibit the 1993 foregone harvest value exhibit which is Plaintiffs 3738 and the 1994 foregone herring harvest exhibit which is Plaintiffs 3777 is it your opinion that that's what those fishermen would have caught but for either the closures or the failures and the harvest for those years that we've talked about?

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- (1) **A Exactly**
 (2) **MR O NEILL** I have no further questions
 (3) **THE COURT** You may cross-examine
 (4) **CROSS EXAMINATION OF STEVEN HUGHES**
 (5) **BY MR COOPER**
 (6) **Q Mr Hughes** my name is Bert Cooper I don t think we ve
 (7) met before
 (8) **A Glad to meet you**
 (9) **Q How are you?**
 (10) **A Good**
 (11) **Q You ve been in court a few times other courts?**
 (12) **A I have**
 (13) **Q If I remember right - you have testified in about how many**
 (14) **cases?**
 (15) **A I think I stated earlier today between 15 or 20**
 (16) **Q Let s see I thought - did I see you reading something**
 (17) **when we were back waiting to come on?**
 (18) **A Probably**
 (19) **Q What was that?**
 (20) **A I said probably**
 (21) **Q I m sorry what was it that you were reading?**
 (22) **A I was reading a summary of the exhibits that we just went**
 (23) **through**
 (24) **Q Did you leave that up here?**
 (25) **A I did**

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- (1) **Q I wonder if I might have a quick look at it?**
 (2) **A It s with counsel**
 (3) **Q While I m doing that let me ask you one question On the**
 (4) **1993 harvest estimate that you did foregone harvest estimate**
 (5) **that was - you kind of took off from the ADF&G estimate if I**
 (6) **understand it right?**
 (7) **A Yes I think that s accurate We started with their**
 (8) **forecasted biomass for 1993**
 (9) **Q And if there were any revisions to that you would want to**
 (10) **include those revisions?**
 (11) **A We didn t incorporate any revisions to that forecast that**
 (12) **were made after the stock returned and it was realized that**
 (13) **there was a substantial reduction compared to what was**
 (14) **expected And the reason was that we wanted to calculate what**
 (15) **the catch would have been had there been no adverse impact**
 (16) **So**
 (17) **we measured what it would have been as a forecast compared**
 (18) **to**
 (19) **what actually occurred**
 (20) **Q If I may approach Your Honor is this what you were**
 (21) **talking about Not quite what I had in mind but maybe that s**
 (22) **what you had in mind**
 (23) **A I think this was in there but this is not the only thing**
 (24) **that was there**
 (25) **Q What else was in there?**
 (26) **A There were these same exhibits that we d just gone through**
 (27) **Q Anything else?**

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- (1) **A There is a narrative**
 (2) **Q A narrative Do you know where the narrative is?**
 (3) **A It was in that same material to the best of my knowledge**
 (4) **Q Maybe I could ask for the narrative Your Honor if it s**
 (5) **here Let me ask to show you this Is this the narrative you**
 (6) **were referring to?**
 (7) **A Yes this appears to be it**
 (8) **Q That s a narrative of the testimony that you gave?**
 (9) **A Well that s not my narrative That s the attorney s**
 (10) **narrative**
 (11) **Q Could I see that again?**
 (12) **So the attorneys gave you this?**
 (13) **A Did they give that to me?**
 (14) **Q Yes**
 (15) **A Yes they did**
 (16) **Q This is what you were studying for your testimony?**
 (17) **A Well I was looking at it to see what questions they were**
 (18) **going to ask me that s right**
 (19) **Q Well it s got questions and what the answers are doesn t**
 (20) **it?**
 (21) **A It s got my answers if there are any answers there**
 (22) **Q Who actually wrote this?**
 (23) **A I believe that was put together from answers from my**
 (24) **depositions that were earlier taken and I believe from the**
 (25) **documents that we prepared**

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- (1) **Q But who put it together I guess is what I really want to**
 (2) **know**
 (3) **A I can t tell you that**
 (4) **Q You didn t do it?**
 (5) **A No**
 (6) **MR COOPER** Maybe Your Honor with your permission
 (7) **we could have this marked as an exhibit?**
 (8) **THE COURT** Yeah you can mark it as an exhibit
 (9) **MR O NEILL** I object I don t know what is the
 (10) **relevance**
 (11) **THE COURT** He wants it marked he can mark it
 (12) **MR COOPER** We ll take care of that later
 (13) **BY MR COOPER**
 (14) **Q I ve just got a few questions on prices**
 (15) **A Go ahead**
 (16) **Q Let s see The 1989 numbers that you came up with for**
 (17) **prices if I remember correctly those changed yesterday?**
 (18) **A My prices haven t changed**
 (19) **Q I thought you had previously provided an exhibit that had**
 (20) **different prices than one that we received yesterday or the day**
 (21) **before yesterday that had some new price on there Does that**
 (22) **ring a bell?**
 (23) **A Not for me it didn t**
 (24) **Q The prices that you use currently for 1989 numbers are**
 (25) **prices that you got from where?**

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- (1) A Yeah 89 was actually pretty simple We had fisheries
 (2) that occurred at Kodiak and Cook Inlet We used those same
 (3) prices that were paid to the fishermen And for Prince William
 (4) Sound where there was no fishery we used the prices that
 were
 (5) identified by the Exxon claims office as the grounds prices so
 (6) we used perhaps fair to say your prices
 (7) Q You took the Exxon claims prices and you thought those
 were
 (8) fair prices?
 (9) A We looked at those and decided that they were based on a
 (10) substantial amount of information and we used those
 (11) Q And you thought they were fair prices?
 (12) A I think for the most part they were fair prices
 (13) Q Let me ask you a couple questions on 1994 damages your
 (14) calculations for this year
 (15) A Yes
 (16) Q You've got some price assumptions in there correct?
 (17) A That's right.
 (18) Q You mentioned I think if I heard you right I think you
 (19) said we talked to processors and ADF&G I believe?
 (20) A Yes
 (21) Q Who is the we?
 (22) A Who is the "we"? I was actually in Anchorage during the
 (23) period when it became apparent that the 1994 Prince William
 (24) Sound oil spill was not going to come in and I met with people
 (25) from Prince William Sound pound fisheries and wild roe on kelp

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- (1) fisheries here in Anchorage and talked with them about what
 (2) those prices were going to be for that year had there been a
 (3) fishery
 (4) There was a gentleman by the name of Paul Reed and he had
 (5) one or two of his employees with him That was part of the
 (6) information and there was also conversations with the seiners
 (7) association
 (8) Q These were conversations that you had?
 (9) A Some were conversations that I had some were
 conversations
 (10) that other people in my office had because I wasn't there
 (11) Q Do you know who they spoke with at ADF&G?
 (12) A There are some notes that were prepared on that and those
 (13) people I believe are identified in those notes I don't
 (14) remember all the names off the top of my head
 (15) MR COOPER Your Honor I don't have any further
 (16) questions of the witness
 (17) MR O NEILL No -
 (18) THE COURT You are through?
 (19) MR O NEILL I have no questions
 (20) THE WITNESS Thank you I appreciate that
 (21) THE COURT I didn't get the signal
 (22) MS WAGNER Plaintiffs call Margaret Louise Parker by
 (23) deposition designation
 (24) THE CLERK Raise your right hand
 (25) (The Witness Is Sworn)

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- (1) THE CLERK Please take the witness stand For the
 (2) record please state your full name your address and spell your
 (3) last name?
 (4) A Susan C E T P I S O N 4089 Carmel Brooks San Diego
 (5) California
 (6) MS WAGNER You might want to pull the silver
 (7) microphone a little closer to you
 (8) DIRECT EXAMINATION OF MARGARET PARKER (read)
 (9) BY MS WAGNER
 (10) Q Would you please state your full name for the record and
 (11) spell your last?
 (12) A My full name is Margaret Louise Parker P A R K E R
 (13) Q Your occupation?
 (14) A Self-employed
 (15) Q And you say you're currently self-employed do you have
 any
 (16) specific employment at this particular moment?
 (17) A I'm working on a couple projects but specifically no I
 (18) was dismissed from Alaska Seafood Marketing Institute about a
 (19) month ago and I'm starting to work on projects that involve
 (20) some of the things I did in previous jobs
 (21) Q Well what were the circumstances of your leaving Alaska
 (22) Seafood Marketing Institute or ASMI?
 (23) A I was dismissed
 (24) Q What was your position at the time you left ASMI?
 (25) A Export program manager

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- (1) Q How long had you held that position?
 (2) A Two years
 (3) Q Could you tell me what your educational background is Miss
 (4) Parker?
 (5) A Two years at the University of Washington
 (6) Q And when was that?
 (7) A 1971 to three
 (8) Q What was your course of study during those years?
 (9) A Russian language and literature
 (10) Q And what did you do in 1974?
 (11) A I moved to Cordova Alaska
 (12) Q And what employment did you have in Cordova?
 (13) A I was unemployed for most of the summer with the exception
 (14) of working itinerantly on commercial fishing boats as a crew
 (15) Q What was your first serious employment if I can put it
 (16) that way after you moved to Cordova?
 (17) A Let's see I think it was as a reporter for the Cordova
 (18) Times
 (19) Q When was that?
 (20) A It would have been the fall of '74
 (21) Q How long did you hold that position?
 (22) A Approximately three - four years
 (23) Q Was that a full time job?
 (24) A Yes
 (25) Q What was your next full time employment after being a

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- (1) reporter on the Cordova Times?
 (2) A I worked for the Marine Advisory Program University of
 (3) Alaska
 (4) Q And could you tell me generally the type of projects you
 (5) worked on with that entity?
 (6) A The agent was a business major and he devised the
 (7) break even formula for fishermen so we organized seminars
 that
 (8) disseminated that kind of information to fishermen And I
 (9) helped him write and in some cases wrote a weekly column for
 (10) the
 (11) newspaper about what the SEA Grant program was doing We
 ran
 (12) seminars on fishing safety He was involved with other agents
 (13) in the state putting together a safety manual with a video and
 (14) a work booklet for fishermen so I worked on that project And
 (15) he worked with Cordova Aquatic Marketing Association
 (16) Q And how long did you work as a part of that program?
 (17) A As I said I think it was two years
 (18) Q So what are we up to around 1980 now when you left that
 (19) program?
 (20) A Probably 79 or 80
 (21) Q What was your next position?
 (22) A As I recall the next position was as manager of the Copper
 (23) River Fishermen s Co op
 (24) Q How many years did you work as manager of the Co op?
 (25) A One

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- (1) Q And what did you do the following year?
 (2) A The following year I worked for Cordova Aquatic Marketing
 (3) Association/Cordova District Fishermen United
 (4) Q And what did you do for those entities?
 (5) A I worked as an administrative assistant for the president
 (6) Q What was your next position after that?
 (7) A As Pacific Editor for Seafood Business Magazine in Seattle
 (8) Q And were you based in Seattle while you were working for
 (9) Seafood Business magazine?
 (10) A Yes
 (11) Q What years did you work for that magazine?
 (12) A From 1984 to 1989
 (13) Q What did you do in 1989 I take it you left the magazine
 (14) at that - in that year?
 (15) A Yes I began working for National Fisheries Institute
 (16) Q And what is the National Fisheries Institute?
 (17) A It s the largest seafood trade association in the country
 (18) Q And what was your position with the National Fisheries
 (19) Institute?
 (20) A I was a public affairs representative
 (21) Q What were your job responsibilities?
 (22) A To act as a liaison between the industry and the press
 (23) Q And where were you based?
 (24) A Washington D C
 (25) Q And then when was it that you went to work for the Alaska

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- (1) Seafood Marketing Institute?
 (2) A In May of 89 I was loaned to ASMI by NFI to work on a
 (3) temporary basis to handle the press calls that were coming in
 (4) as a result of the Spill
 (5) Q And when you say you were loaned what does that mean
 (6) exactly?
 (7) A ASMI reimbursed NFI for my salary I stayed officially an
 (8) employee of NFI throughout the whole time
 (9) Q How long did you stay with ASMI on this basis?
 (10) A Approximately five months
 (11) Q So May through the end of September?
 (12) A Right
 (13) Q Do you recall when in May you joined ASMI?
 (14) A Approximately the first week as I recall
 (15) Q How did that arrangement come about do you know?
 (16) A What arrangement?
 (17) Q The arrangement whereby you were loaned by NFI to ASMI?
 (18) A The executive director of ASMI telephoned my boss the
 (19) executive director of NFI and asked if he- if they could
 (20) borrow me
 (21) Q And that was - Mary Tuten was the executive director of
 (22) ASMI?
 (23) A Yes her name is pronounced Tuten
 (24) Q And then in October of 1989 did you go back full time with
 (25) the Institute?

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- (1) A Yes
 (2) Q How long did you continue to work there?
 (3) A Until February of 90 I m sorry it might have been March
 (4) of 90
 (5) Q And what happened then?
 (6) A I was offered a job in Seattle so I left NFI and came to
 (7) Seattle
 (8) Q And what was the job in Seattle?
 (9) A Export program director for ASMI
 (10) Q Was your experience in 1989 that traders in fact were
 (11) concerned about possible effects of the oil spill on the
 (12) marketing of Alaskan salmon?
 (13) A Absolutely
 (14) Q Can you elaborate please?
 (15) A My observation of members of the industry during that time
 (16) was that they were extremely uncertain of what the season
 would
 (17) bring for them And under normal circumstances the
 uncertainty
 (18) of the upcoming season makes everyone involved in
 negotiating
 (19) and involved in making contracts for future sales very prudent
 (20) very cautious very unwilling to take any more of a risk than
 (21) it is inherently necessary to take in the salmon business The
 (22) variables are huge they exceed the number and the magnitude
 of
 (23) most other seafood seasons So under normal conditions the
 (24) trade would have been extremely cautious anyway in terms of
 (25) setting up ex vessel prices or other costs to their

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- (1) operations When the Spill occurred everyone was completely
 (2) overwhelmed by the uncertainty of what this meant for their
 (3) businesses so the level of panic and anxiety and uncertainty
 (4) was higher than I've ever seen it
 (5) Q Is it frequently during the preseason that is before the
 (6) salmon fishing begins that processors and fishermen set the
 (7) ex vessel price?
 (8) A It's traditional that that's the period when negotiations
 (9) begin and end
 (10) Q And in 1989 did you have occasion to be present at meetings
 (11) where processors and fishermen were present preseason that
 (12) is
 (12) before the salmon fishing began?
 (13) A Yes
 (14) Q During those meetings was concern expressed by
 (15) processors
 (15) and fishermen and the like regarding the impact of the oil
 (16) spill on the marketing of salmon?
 (17) A Yes it was expressed more than just by processors and
 (18) fishermen
 (19) Q Who else expressed the concern?
 (20) A Resource managers members of information agencies
 (21) specifically not the press but SEA Grant Manne advisors for
 (22) instance or observers from UAA or the government state
 (23) government
 (24) Q And during this preseason period at these meetings what
 (25) were some of the concerns being expressed regarding the
 impact

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- (1) of the Exxon Valdez oil spill on the marketing of salmon?
 (2) A The concerns that I recall observing and hearing during
 (3) those meetings or during conversations about the atmosphere
 (4) in
 (4) different communities that were affected or were expecting to
 (5) be affected by the oil spill ranged from whether this meant
 (6) that there would be any business conducted this season
 whether
 (7) there would be any fish return No one knew the fundamental -
 (8) whether or not the fundamental aspects of this business would
 (9) even exist or unfold People were very very confused didn't
 (10) know where to go for answers there was speculation that the
 (11) salmon wouldn't return at all
 (12) Q Was your impression based on sitting through these
 (13) meetings hearing all these concerns being
 (14) expressed then that traders and processors were approaching
 (15) the '89 season in a very cautious manner?
 (16) A I would say that's a fairly accurate description to say
 (17) that they were approaching it in a cautious manner
 (18) Q Now these concerns that the traders and the processors
 (19) were expressing first of all is it a fair statement that the
 (20) environment preseason was one that almost bordered on
 (21) hysteria or how would you describe it?
 (22) A There were specific behaviors that I witnessed that I would
 (23) say bordered on hysteria I don't know that I would use that
 (24) word to categorize as a whole all of the attitudes or
 (25) approaches that were exhibited following the Oil Spill through

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- (1) the season of 1989
 (2) Q What were some of the specific instances?
 (3) A When there were meetings meetings that included fishermen
 (4) and processors in front of cameras or individual or smaller
 (5) group interviews by the press that specifically targeted on
 (6) the affected individuals perceived loss or the affected
 (7) individuals perceived impact on him or her or their life-style
 (8) or their business as a result of the oil spill There was a
 (9) meeting in Kodiak that I attended of fishermen that was
 (10) publicized and I recall an individual fishermen holding forth
 (11) quite dramatically about this meant the end of his way of life
 (12) as he knew it and in the community and the Kodiak's way of
 (13) life
 (14) Q Now you referred yesterday to this concern among traders
 (15) and buyers of a self-fulfilling prophecy and that's also
 (16) referenced to in the Burson Marsteller survey that we just
 (17) talked about What is- or what was the concern about this
 (18) self-fulfilling prophecy amongst the traders and buyers of
 (19) Alaska salmon?
 (20) A Well the best analogy I could give to someone that hasn't
 (21) lived through this is to fishermen or processors or anyone in
 (22) Alaska that was in front of a camera or in any other way
 (23) influenced by the press by telling them our salmon was not
 (24) contaminated did nothing but raise the specter of contaminated
 (25) salmon in the viewers' mind So if we saw or heard that

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- (1) individuals or groups were going to express their fear to the
 (2) public at large or to a camera or microphone that they were
 (3) afraid that their livelihood would be contaminated by oil we
 (4) were very careful and very quick to explain the ramifications
 (5) of that sort of public statement that it could then bring to
 (6) mind in consumers' eyes a real concern that hadn't been there
 (7) before
 (8) Q Would it then be in the interest of anyone in the industry
 (9) wherever they are along the chain of distribution to keep
 (10) references and mentions out of the trade literature regarding
 (11) the oil spill -
 (12) A My view during the time that I worked for ASMI for that
 (13) very purpose to make decisions like this was that yes it
 (14) absolutely would be in their interest to avoid connection with
 (15) that
 (16) Q And in fact were those suggestions or recommendations
 (17) that you were making to people in the industry as you know
 (18) don't draw attention to it and don't write about it the trade
 (19) journals and the like?
 (20) A Yes
 (21) Q So at least to the extent then of reviewing the trade
 (22) literature we don't see specific references to the Exxon
 (23) Valdez oil spill and its impacts on the marketing of salmon to
 (24) that extent at least people were following suggestions of ASMI
 (25) in not publicizing and not playing that up?

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- (1) A To some extent we were successful at that and I can say
 (2) that the majority of members of the trade took our advise but
 (3) not everyone did
 (4) Q Who did not take your advice can you think of some
 (5) instances?
 (6) A I cannot bring to mind anything specific but it seems to
 (7) me that there were a few less than four instances that were
 (8) brought to the attention of the General Office during that
 (9) summer of retailers in the Lower 48 specifically posting signs
 (10) that said Alaska salmon not caught in oiled area or not caught
 (11) in the oil spill area It was very discouraging to see
 (12) Q Could you look at Exhibit 3377 for a minute please?
 (13) Have you found that page Miss Parker?
 (14) A Yes
 (15) Q The first sentence - well the first two sentences of have
 (16) document say Throughout the summer our staff of five
 (17) responded to oil spill related calls from the marketplace at a
 (18) rate of about 200 a day The questions ranged from how do I
 (19) tell if my seafood is contaminated to are Alaska products safe
 (20) to eat and how will the spill affect my retail seafood store in
 (21) Ohio In fact is that a true statement that there were
 (22) numerous phone calls throughout the course of the summer by
 (23) various people in the Alaskan salmon trade business inquiring
 (24) about the oil spill and oil spill related matters?
 (25) A Yes To the best of my understanding that s an accurate

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- (1) two sentences
 (2) Q And it was your observation and experience that traders
 (3) continued to be concerned about the marketability of Alaskan
 (4) salmon throughout the course of the summer?
 (5) A I think to some degree that s safe to say It s impossible
 (6) for me to speculate whether everyone had that level of concern
 (7) throughout that period
 (8) Q No I didn t mean to imply that everybody had that But
 (9) in general traders - a large number of traders expressed
 (10) concern in questions to you throughout the course of the
 (11) summer
 (12) regarding the marketability of Alaskan salmon because of the
 (13) oil spill?
 (14) A Yes and beyond that
 (15) Q Can you elaborate please?
 (16) A Their concerns that I was aware of exceeded the ending of
 (17) the season I left ASMI in late September but my
 (18) understanding is that there was some concern which translated
 (19) into telephone calls to the Juneau office that happened after
 (20) that and into the early part of 1990
 (21) Q Do you know did ASMI keep any sort of telephone log
 (22) regarding these - it sounds like thousands and thousands of
 (23) phone calls from nervous people in the - from the trading
 (24) segment of the industry?
 (25) Well is it fair to say there were thousands of calls?
 (26) A The arithmetic would add up to over a thousand calls, yes

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- (1) Referring to your question about phone logs I think each
 (2) individual employee kept separate phone logs so yes there
 (3) would be
 (4) Q And was there a concern expressed by some traders that
 (5) should any contaminated fish find its way to let s say Japan
 (6) that the entire pack may be seized or at least part of the pack
 (7) will be seized?
 (8) A Not that I was aware I didn t hear any concerns
 (9) specifically about that that I can recall
 (10) Q What were the concerns that you were hearing were they
 (11) related more to some sort of consumer resistance to buy the
 (12) fish because of the spill?
 (13) A The concerns that I recall hearing and as I said I can t
 (14) specifically recall all of them but my memory is that they
 (15) were more immediate how will this affect our immediate need
 (16) for salmon This is a fishery that s gone on for a hundred
 (17) years people who have been in the business have expected to
 (18) have a certain amount of Copper River sockeye in the first week
 (19) in June how will this oil spill affect those kinds of issues
 (20) Q Were there any - was there any publicity about people
 (21) speculating about what the long term affects may be or health
 (22) risks associated with the oil spill?
 (23) A I recall some articles in national publications that may
 (24) have speculated about the long term affects publications such
 (25) the New York Times or the Washington Post

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- (1) Q Did that help the marketing of Alaskan salmon?
 (2) A I don t think that helped reassure members of the trade
 (3) Q And if fact isn t that specifically one of the things you
 (4) were trying to prevent is that sort of publicity from being
 (5) disseminated to the marketplace?
 (6) A Vis-a vis Alaska seafood yes
 (7) Q Do you know how widely disseminated this NOAA study
 (8) was?
 (9) Apparently Mr Pratt from the Chicago Tribune had a copy of it
 (10) or at least had information regarding it Do you know how
 (11) widely disseminated either the report was or the information
 (12) was regarding these bad affects of manne organisms ingesting
 (13) crude oil?
 (14) A I don t have any idea I remember specifically asking the
 (15) author if she knew and she was very adamant in telling me that
 (16) she would provide it to whoever asked and did not elaborate in
 (17) terms of numbers or individuals
 (18) Q Were you concerned that this type of information could
 (19) potentially become a food scare type of a situation?
 (20) A Yes
 (21) Q Could you elaborate please?
 (22) A This was a crisis the magnitude of which the seafood
 (23) industry had not ever seen We weren t certain we being the
 (24) seafood industry were not certain how it would be played out
 (25) It was often compared to the botulism incident of the early
 (26) 80s where a man died in Europe and sale prices and
 (27) movements

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- (1) were effected for several years following that In a situation
 (2) like this where there is such a high level of uncertainty the
 (3) things that we were afraid of were a much longer list of the
 (4) things that we knew for sure would not occur and we did not
 (5) have to be afraid of So in trying to responsibly deal with
 (6) the damage control and the misperceptions that could have
 (7) occurred we needed to expect the worst and be prepared for
 (8) that So to that end we were very concerned that there could
 (9) be a snowball affect on the seafood industry with the
 (10) preponderance of press stories about the spill being connected
 (11) in consumers or trade members minds as contaminating the
 (12) seafood from Alaska that season
 (13) MS WAGNER Thank you Nothing further
 (14) MS STEWART Brief cross examination
 (15) CROSS EXAMINATION OF MARGARET LOUISE PARKER
 (read)
 (16) BY MS STEWART
 (17) Q Do you have your script?
 (18) A Yes
 (19) Q Miss Parker in your deposition the court reporter asked
 (20) what is your mailing address
 (21) A 1016 8th Avenue North Number 302 Seattle Washington
 (22) 98109
 (23) Q Your occupation?
 (24) A Self employed
 (25) Q Could you tell me when you were born please?

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- (1) A June 16th 1952
 (2) Q And where?
 (3) A Spokane Washington
 (4) Q Why don t you tell me when you first took the job who you
 (5) reported to and then if it changed over the course of the two
 (6) years tell me what changed?
 (7) A I always reported to the executive director and that
 (8) position changed three times in the two years I worked there
 (9) Q And when you first came on was it Lennie Gorsuch?
 (10) A No it was Eric Eckholm
 (11) Q And then who was next?
 (12) A Lennie Gorsuch
 (13) Q And who was the third?
 (14) A Kim Elton
 (15) Q Do you recall any of the names of any of the skippers you
 (16) crewed for on vessels?
 (17) A Let s see Because that summer was so much more a
 (18) vacation
 (19) than it was making money I don t recall I crewed for
 (20) probably half a dozen people and half of them were more for
 (21) fun
 (22) than for income
 (23) Q I m going to skip to the next page page 28 line 3
 (24) Who is executive director of NFI?
 (25) A Lee Weddig W E D D I G
 (1) Q Regarding you job starting there in spring of 1990 as
 (2) export program director for ASMI or ASMI who offered you that

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- (1) job?
 (2) A Eric Eckholm
 (3) Q You indicated earlier in the summer of 1974 you crewed on
 (4) some boats I guess partly for recreation and partly to help
 (5) out fishermen Other than that crew experience have you ever
 (6) fished commercially in the State of Alaska?
 (7) A Yes
 (8) Q Could you tell me where and when?
 (9) A In Prince William Sound and the Copper River and it was
 (10) during the summers of 1977 78 perhaps 79
 (11) Q And what was that - was that as a crew member?
 (12) A Yes
 (13) Q Who did you crew for?
 (14) A I don t recall The longest period was with my then
 (15) husband Paul Swartzbart but there were others
 (16) Q I m going to show you what s been marked in your
 (17) deposition
 (18) as Exhibit 3375 and in this trial DX2935 for identification
 (19) Miss Parker and it s been - it s headed draft and then says
 (20) ASMI s response unique in oil spill saga This was a document
 (21) that was produced to us by ASMI Have you seen this before?
 (22) A Yes
 (23) Q And do you know who prepared this?
 (24) A I think this was prepared by a group of us in Juneau
 (25) probably including Mary Tuten myself and Kevin O Sullivan
 (1) Q Do you know roughly when it was prepared?

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- (1) A When it was prepared?
 (2) Q Uh huh
 (3) A Judging from the references in the body of this document
 (4) I d say in July or August of 1989
 (5) Q It appears to me from reviewing that it summarizes
 (6) chronologically effects that ASMI was involved with following
 (7) the Valdez Oil Spill is that generally accurate?
 (8) A Yes
 (9) Q Turn if you would to the second page and at the bottom
 (10) the last paragraph reads three days after the spill members
 (11) of the ASMI s board and marketing committee met in Seattle
 (12) with
 (13) executive director Mary Tuten They agreed to develop a fact
 (14) sheet to provide information about the spill and it s effects
 (15) on the seafood industry
 (16) A week later, quote ten facts you should know about the
 (17) recent oil spill in Alaska end quote was mailed to 20 000
 (18) seafoods buyers across the country
 (19) Do you know whether or not that s accurate that a fact
 (20) sheet of that type was sent out shortly after the oil spill by
 (21) ASMI?
 (22) A As far as I know that s accurate
 (23) Q Have you ever seen a copy of that fact sheet?
 (24) A Yes
 (25) Q Then the next paragraph says four days after the spill
 (1) ASMI conducted a soft poll market survey in ten U S cities

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- (1) Questions were submitted to Tokyo London and Paris also
The
- (2) results everyone knew about the spill but no one is changing
(3) their buying habits because of it This early intelligence was
(4) enormously important in determining ASMI s initial response to
(5) the spill
(6) Do you know whether or not those statements are accurate?
(7) A Are you referring to the phrase following the results
(8) quote?
(9) Q Yes excuse me well maybe we can start with did you -
(10) was it your understanding that a so-called soft poll was
(11) conducted within a few days after the oil spill by ASMI?
(12) A Yes that s my understanding
(13) Q Did you understand that the results of that soft poll as
(14) ASMI interpreted them were that everyone knew about the spill
(15) but no one was changing their buying habits because of it?
(16) A I have no reason to believe that that s inaccurate
(17) Q Did you ever discuss that topic with Mary Tuten?
(18) A I don t recall a specific conversation with her regarding
(19) that but we may have
(20) Q Did she ever describe to you the results of the soft poll
(21) that was conducted by ASMI?
(22) A She may have I don t recall specifically
(23) Q Is this description consistent with what she described to
(24) you?
(25) A My memory of it would have been that it is yes

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- (1) Q Still referring to DX2953 the next paragraph says from
(2) the beginning advertising and public relations agencies
(3) advised ASMI to launch a high profile reassurance campaign
(4) Quote everyone wanted us to run out there and tell the world
(5) that Alaska seafood was uncontaminated but we were
concerned
(6) about creating a perception problem when none existed
(7) Are the statements in that paragraph accurate?
(8) A As far as I know
(9) Q Did you think there was a risk that if ASMI launched a high
(10) profile public relations campaign to assure the world that
(11) Alaska seafood was safe that people might begin to draw a
(12) connection that they hadn t previously drawn?
(13) A Yes that was a possibility
(14) Q At least in the spring of 1989, a few days after the spill
(15) when that soft poll was conducted, that seemed to indicate that
(16) people were not making the connection at least as of that
(17) point correct?
(18) A Almost immediately following the spill correct
(19) Q And then down below the paragraph we just read the
(20) statement is made in the end the cautious approach prevailed
(21) the wisdom of that this was underscored in subsequent market
(22) survey results Do you know what that s referring to?
(23) A I m assuming that would be the Burson Marsteller studies
(24) Q In the deposition I m showing you what has been marked as
(25) Exhibit 3376 at the deposition Miss Parker and it was a

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- (1) document entitled news flash dated June 1989 Do you recall
(2) having seen this document before?
(3) A Yes
(4) Q In your position with ASMI in the spring and summer of
(5) 1989 did you have responsibility for issuing news releases
(6) like this one?
(7) A Yes
(8) Q Did you in fact prepare this document?
(9) A Yes
(10) Q In the second paragraph of the document that I m showing
(11) you in your deposition where the heading oil spill response
(12) occurs the statements are made five days after the grounding
(13) of the tanker preliminary market surveys were conducted in the
(14) U S France Japan and the UK Was your reference there to
(15) the so called soft poll that was described in the previous
(16) exhibit that we looked at?
(17) A I think so
(18) Q And then the next sentence in this document I m showing
(19) says consumers had not made the connection between the
seafood
(20) products and the Spill but the trade was concerned about
(21) pricing and availability Was that a true statement at the
(22) time you prepared this document?
(23) A Absolutely correct
(24) Q And when you say that the trade was concerned about
pricing
(25) and availability did you mean that buyers or processors of

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- (1) seafood was concerned that there might be an impact on the
(2) supply of seafood as a result of the spill related closures?
(3) A The concern that I observed among the trade was very very
(4) broad and it included those things that you mentioned as well
(5) as others Some cases buyers were concerned in a way that
(6) they couldn t articulate No one had ever dealt with this kind
(7) of tragedy before and no one knew what to expect
(8) Q But among their concerns was that the supplies might be
(9) constricted because of spill related closures?
(10) A Yes
(11) Q Was there also a concern that prices might be bid up if
(12) prices were limited?
(13) A There may have been a concern about that
(14) Q Well do you recall buyers or processors expressing the
(15) concern that salmon prices grounds prices might be higher
(16) because of a limitation in the supply as a result of spill
(17) related closures?
(18) A My memory of the conversation and observations I made
(19) during that period may have included those comments and
(20) observations from members of the trade but as I said the
(21) concern was very broad and very likely included other
concerns
(22) Q Yes I understand that My question is were there people
(23) processors buyers who expressed the concern that prices
might
(24) be higher because of the limitation on the supply? Do you
(25) recall that concern being expressed?

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- (1) A I think i have answered that to say that that was part of
 (2) what I observed and heard
 (3) Q Do you recall any other concerns about pricing being
 (4) expressed other than what you ve described?
 (5) A People were concerned about everything regarding their
 (6) business and the success of their business They truly did not
 (7) know what to expect The dynamics involved in this business
 (8) are very difficult to predict and no one knew what the results
 (9) or the ramifications of the spill would be No one knew the
 (10) spent extent of the spill in May It was still growing it was
 (11) still traveling
 (12) Q I understand but do you recall a name date place when
 (13) any person expressed to you any other concern about the price
 (14) other than what you ve talked about?
 (15) A Grounds price or other pricing issues
 (16) Q That s my line
 (17) The grounds price or any other pricing issue?
 (18) A Specifically in those terms no
 (19) Q At your deposition Miss Parker I m going to be showing
 (20) you what s marked as 3377 and is entitled ASMI program/oil
 (21) speech have you seen this document before?
 (22) A Yes
 (23) Q Over on the second page the second paragraph says Five
 (24) to six days after the grounding we initiated a worldwide soft
 (25) poll of our contacts to see how the consumers and food service

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- (1) trade were reacting to the spill on Alaska seafood We found
 (2) that in general the consumer was more concerned with the
 (3) environmental impacts and was not making a connection
 (4) between
 (5) oiled birds and otters and the possibility of Alaska seafood
 (6) being contaminated Is that an accurate description of the
 (7) soft poll?
 (8) A I have no reason to believe that what I m reading here
 (9) isn t an accurate description
 (10) Q Over on page 4 this same document that I m showing you in
 (11) your deposition again in the last paragraph there is a
 (12) description of during the time the survey data was being
 (13) collected and I assume that means that the Burson Marsteller
 (14) survey data ASMI was being pressured to put on a public
 (15) relations campaign and then in the last sentence of the
 (16) paragraph the statement is made besides we don t believe it
 (17) was really appropriate to spend a whole lot of money
 (18) convincing
 (19) the general consumer that the seafood they were eating wasn t
 (20) contaminated when our initial soft poll research informed us
 (21) that they hadn t made the connection to he possibility of it
 (22) being contaminated with the oiled birds and the sea otters they
 (23) were seeing daily on national TV
 (24) Was that Merry Tuten s view between the soft poll and the
 (25) receipt of the Burson Marsteller survey results?
 (26) A As far as I know yes
 (27) Q Did you agree with her view in that regard?

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- (1) A To the extent of what we were trying to accomplish yes I
 (2) did
 (3) Q I also wanted to ask you do you still have family members
 (4) or friends who fish in the Cordova area?
 (5) A Friends yes
 (6) Q A number of friends who fish in Cordova?
 (7) A Yes
 (8) Q Do you think that that zero tolerance policy was successful
 (9) in assuring the quality of Alaska seafood that summer?
 (10) A I can t really say We certainly hoped that it would have
 (11) been In order to accurately answer that question I guess I
 (12) would have to know what impulses motivated buyers to make
 (13) their
 (14) purchase both from the wholesale segment all the way down to
 (15) the final consumer
 (16) Q Just from the standpoint of preventing contaminated seafood
 (17) from entering the market stream do you believe the policy was
 (18) successful in accomplishing that?
 (19) A I never heard of any contaminated seafood making it into
 (20) the market
 (21) Q Do you believe that was the result of the tough zero
 (22) tolerance policy that was imposed?
 (23) A It probably had a lot to do with it yes
 (24) Q I m showing you in your deposition what s been marked as
 (25) Exhibit 3382 Is that an article that you authored in or about
 (26) October of 1989?

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- (1) A Yes
 (2) Q On the first page at the bottom of the first column you
 (3) talk about various people and PR experts counseling the Alaska
 (4) seafood processors to take action and in the last sentence of
 (5) the paragraph the top of the second column you say Why not
 (6) ride the tail end of the news comment and get the seafood
 (7) message out before the oil spill story loses its sizzle And
 (8) then you go onto say There are two reasons why not One
 (9) it s not the story the press is writing about Two the story
 (10) they are writing about is extremely bad news why connect
 (11) yourself to it Was that your belief in the summer of 1989
 (12) with respect to mounting a major public relations campaign
 (13) about the quality of the Alaska seafood?
 (14) A With respect to the message we were directing towards the
 (15) trade yes
 (16) Q In retrospect do you still believe that that was the best
 (17) reaction to take to the spill and the surrounding situation?
 (18) A Given no changes in any other circumstances?
 (19) Q Yes
 (20) A Yes
 (21) Q When you say it s not the story the press is writing about
 (22) you mean the press is not writing about quality impacts on
 (23) Alaska seafood?
 (24) A The story was not writing about the quality issue of
 (25) salmon yes

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- (1) Q What were they writing about?
- (2) A The press was writing about the oil spill
- (3) Q And then you go onto say in this exhibit that we re looking
- (4) at in your deposition two the story that they are writing
- (5) about is extremely bad news why connect yourself to it Was
- (6) it your advice and counsel when you were at ASMI to try to
- (7) avoid connecting the seafood quality issue to what the press
- (8) was writing about?
- (9) A Unnecessarily so yes and irresponsibly so yes There
- (10) were some cases where we couldn t avoid it
- (11) Q Do you think that by and large you were successful in
- (12) avoiding that connection?
- (13) A Yes
- (14) Q Over on the second page of the column in this exhibit that
- (15) we re still looking at in your deposition in the next to the
- (16) last paragraph about two thirds of the way down you say
- (17) shortly after the Exxon Valdez spill the seafood trade was
- (18) much more concerned about a public perception problem than
- (19) the public was Their concern could have become a self fulfilling
- (20) prophecy prompting worries that consumers otherwise wouldn t
- (21) have Was it your belief in the spring and summer in 1989 that
- (22) the seafood traders and processors were more concerned
- (23) about a public perception problem than the public was?
- (24) A Yes for a specific time in certain areas I would say yes
- (25) Q You say it could have become a self fulfilling prophecy and

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- (1) I think you mentioned that possibility also this morning Is
- (2) it correct that it did not in fact become a self fulfilling
- (3) prophecy?
- (4) A Again I think the short term narrowly focused hope was
- (5) that the focus of the press attention would not singularly look
- (6) at seafood quality in connection with the Spill and in that
- (7) sense we were successful I can t say that consumers or trade
- (8) had no further concerns about the wholesomeness of Alaska
- (9) seafood following the spill up until the current time
- (10) Q But in terms of an immediate media focus that did not
- (11) occur correct?
- (12) A I was not aware of that in most major media coverage
- (13) Q I m going to show you what at the deposition was Exhibit
- (14) 3385 and trial is DX3051 for identification which appears to
- (15) be an ASMI news release for July 14 1989 Is this a document
- (16) you ve seen before?
- (17) A Yes
- (18) Q Did you draft this document?
- (19) A Yes
- (20) Q Was anybody else involved in drafting the document?
- (21) A Mary Tuten may have been involved in it
- (22) Q The opening sentence of this news release says Juneau
- (23) ongoing results from market surveys commissioned by the
- (24) Alaska Seafood Marketing Institute indicate that awareness of the
- (25) Exxon Valdez oil spill among consumers has not affected

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- (1) purchases of seafood from Alaska Was that an accurate
- (2) statement at the time you wrote it?
- (3) A Yes
- (4) Q Was it based on the Burson Marsteller survey work that been
- (5) conducted between April of 1989 and July 14 of 1989?
- (6) A Yes
- (7) MS STEWART Thank you
- (8) MS WAGNER Your Honor plaintiffs call Lloyd Kirban
- (9) by video deposition
- (10) DIRECT EXAMINATION OF LLOYD KIRBAN (video)
- (11) BY VIDEO EXAMINER
- (12) Q Could you state your full name and address for the record?
- (13) A Lloyd Kirban I live at 32 Pinoak Drive Lawrenceville
- (14) New Jersey ZIP code is 08648
- (15) Q Mr Kirban what s your occupation?
- (16) A Research director
- (17) Q Where?
- (18) A Burson Marsteller
- (19) Q Could you tell us what Burson-Marsteller is?
- (20) A Burson Marsteller is a public affairs public relations
- (21) firm
- (22) Q In the public affairs/public relations field is it one of
- (23) the prominent firms in the country?
- (24) A Burson Marsteller is the largest public affairs public
- (25) relations firm in the world

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- (1) Q Following the Exxon Valdez oil spill which was in March of
- (2) 1989 does Burson Marsteller do some research work for the
- (3) Alaska Seafood Marketing Institute?
- (4) A Yes we did
- (5) Q Were you personally involved in that research?
- (6) A Yes
- (7) Q What was the nature of your involvement?
- (8) A As head of the research department I generally supervised
- (9) projects that are being conducted at least out of the New York
- (10) office which is where I m located So in the general
- (11) supervisory capacity I oversaw the conduct of the research and
- (12) played a major role in the writing of the report
- (13) Q Now the oil spill occurred in late March of 1989 Do you
- (14) recall when it was vis a-vis that date that Burson Marsteller
- (15) was retained?
- (16) A I don t know the specific time that it was retained I do
- (17) have an awareness of when we started to conduct the research
- (18) Q Okay When was that?
- (19) A Probably it was in April
- (20) Q What exactly did the Alaska Seafood Marketing Institute or
- (21) Mary Tuten ask you to do?
- (22) A The objective of the research was to assess both at the
- (23) consumer and retail level awareness of the incident purchasing
- (24) behavior which might have been affected by the incident and
- (25) this was conducted in four countries

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- (1) Q And just for the record what were the four countries?
 (2) A The United States Japan the United Kingdom and France
 (3) Q Do you believe that the results of this survey work that you
 (4) did are accurate?
 (5) A Yes sir
 (6) Q What s your basis for believing that?
 (7) A As far as I can recall we had no major problems which
 (8) would in my mind have jeopardized both the design and
 (9) implementation and in using diagnostic research we were
 using
 (10) a vendor who has experience in multi national studies So it s
 (11) my best judgment that the research was done with professional
 (12) ngor and concern about its quality
 (13) Q Showing you Mr Kirban what has been marked as Kirban
 (14) Exhibit 47927 through 47930 respectively are these the final
 (15) reports prepared by you and Burson Marsteller with respect to
 (16) the research work we ve just discussed in Japan France -
 (17) MS STEWART Your Honor objection we had several
 (18) rule 106 counter designations that aren t being inserted into
 (19) this video
 (20) THE COURT Is the problem resolved
 (21) MR O NEILL I think we ve resolved the problem
 (22) we ll continue with the tape
 (23) MS STEWART Yes we have
 (24) THE COURT Thank you
 (25) BY VIDEO EXAMINER

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- (1) Q Okay respectfully
 (2) A Yes sir looks like it
 (3) Q Now the timing of these surveys we talked about them being
 (4) done in May and June of 1989 was that ASMI s determination
 (5) when they came to you when you were contacted they wanted
 the
 (6) surveys done either immediately or as soon as possible?
 (7) A That was my understanding
 (8) Q I d like to visit with you for a little bit regarding some
 (9) of the surveys and could we start with the American survey?
 (10) A Yes sir
 (11) Q Who was the charge of the work that Burson Marsteller did
 (12) for the Alaska Seafood Marketing Institute?
 (13) A The research?
 (14) Q Yeah
 (15) A At the time I had two colleagues at levels below me one
 (16) was a Mr Sid Hecher and the other one was a Ms Deborah
 Amlen
 (17) Q So they reported to you?
 (18) A Yes
 (19) Q And you were ultimately in charge of the research?
 (20) A Yes
 (21) Q Who was involved in designing the survey that you
 (22) conducted?
 (23) A I was involved as was Mr Hecher
 (24) Q How did you go about that how did you decide how to
 design
 (25) survey?

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- (1) A Given the information objectives of the clients we
 (2) developed a questionnaire which we believed reflected those
 (3) information goals
 (4) Q Did you follow recognized survey methodology or
 techniques?
 (5) A Yes sir
 (6) Q And even in what respects how did you go about doing?
 (7) A There are aspect of questionnaire design that are sort of
 (8) standard formulations For example when we designed the
 (9) questionnaire we asked questions about purchasing behavior
 (10) before we asked questions about awareness of the incident in
 (11) order to prevent any biasing of the incident questions
 (12) affecting what the respondent might think would be a rational
 (13) response with regard to the purchasing information
 (14) Q You talked earlier about including for reliability
 (15) purposes including in the questionnaire first questions about
 (16) purchasing behavior period and then additional questions
 (17) Could you elaborate on why you designed the survey that way?
 (18) A There is in the dynamics of a question and answer process
 (19) in an interview the opportunity or the risk of the
 (20) interviewer through the questionnaire either leading the
 (21) respondent to a series of answers or in some way because of
 (22) the structure of the question order influencing the respondent
 (23) to answer in what he or she feels would be a rational or
 (24) socially acceptable way
 (25) Our concern was that if we highlighted the incident first

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- (1) it could very well have affected the subsequent questions on
 (2) the purchase of seafood in order for the individual to seem
 (3) rational and informed and whatever other feelings that the
 (4) respondent is trying to exhibit to the interviewer So the
 (5) purpose of putting the purchasing information first was to get
 (6) as unbiased an estimate of purchasing behavior as possible
 (7) before we introduced the questions dealing with their
 knowledge
 (8) of the presumed effect of the incident on them
 (9) Q Is that a standard survey technique?
 (10) A Yes it is
 (11) Q You indicated that you prepared the reports that summarized
 (12) the research that was done does that include both the what
 (13) are called the top line reports that is the initial short
 (14) summary of the work as well as the ultimate final report?
 (15) A I m not sure I think one of my associates Miss Amlen
 (16) may have submitted some top line results to Alaska Seafood
 (17) Marketing Institute
 (18) Q Start on page 1 Just so for the record doctor if
 (19) you ll bear with me I m going to have you read some of the
 (20) stuff so we know what we re talking about in terms of the
 (21) record all right Would you read the second paragraph
 (22) please Would you read it out loud so we know on the record
 (23) what we re talking about?
 (24) A All Alaskan Seafood currently in the international
 (25) marketplace were caught before the spill occurred or are from

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- (1) areas known to be not contaminated Nonetheless the Alaska
 (2) Seafood Marketing Institute ASMI has received information
 about
 (3) the trades reluctance to receive food products from Alaska
 ASMI
 (4) is concerned about current perceptions among consumers of
 trade
 (5) regarding the extent of the spill and the degree to which those
 perceptions are affecting seafood sales and consumption
 (7) Q And that s information that ASMI reported to your company I
 (8) take it?
 (9) A Yes sir
 (10) Q Then on Roman numeral two you re setting out in effect
 (11) the parameters of the survey where you re saying in part your
 (12) targeting consumers who will purchase seafood likely to have
 (13) come from Alaska in the past two months for home
 consumption or
 (14) who have eaten these products in a restaurant?
 (15) A Yes sir
 (16) Q Doctor turn to Roman numeral seven where it has the
 (17) summary?
 (18) A Yes sir
 (19) Q And the summary in the United States was that there was
 (20) widespread awareness of the spill among the consumers?
 (21) A Yes sir
 (22) Q 95 percent of the people were aware of the Exxon Valdez oil
 (23) spill?
 (24) A Aware of the spill I don t know the specific question that
 (25) they were responding to I would have to look at the

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- (1) questionnaire
 (2) Q And one of your conclusions was that the survey indicated
 (3) there was reluctance to eat seafood from Alaska because of
 (4) health concerns associated with the Spill?
 (5) A Yes sir
 (6) Q And 37 percent of the consumers indicated that in the
 (7) survey?
 (8) A Yes sir
 (9) Q And 29 percent almost 30 percent said outright that they
 (10) didn t believe Alaskan seafood was safe to eat?
 (11) A Yes sir
 (12) Q Then well over 50 percent of the American consumers
 (13) surveyed indicated that they either weren t sure or they were
 (14) skeptical whether the Alaskan seafood industry would provide
 (15) safe seafood?
 (16) A As it s referred to in the last paragraph yes sir
 (17) Q Now on page 9 and this will be a summary of some of the
 (18) conclusions regarding the survey amongst the trade in the
 (19) United States and again the survey indicated that almost all
 (20) of the trade was aware of the Exxon Valdez oil spill?
 (21) A Yes sir
 (22) Q And then you have a conclusion at the bottom doctor where
 (23) it says as many in the trade think the spill will affect
 (24) consumers purchases consumption as think will not?
 (25) A We re reporting some results yes sir

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- (1) Q Is that what you were referring to earlier this morning as
 (2) when you took the surveys in the countries that there was at
 (3) the time the surveys were taken preseason here well before
 (4) the salmon seasons there was concern in the trade that the oil
 (5) spill will affect consumers?
 (6) A At the time we conducted the survey these were the results
 (7) we had with regard to the trade
 (8) Q Now you said that the purpose of the surveys to each of
 (9) the four surveys I believe you said was two-fold One was to
 (10) determine awareness both at the consumer and the trader
 (11) level -
 (12) A Yes sir
 (13) Q And the second purpose was to determine any changes in
 (14) consumption or buying behavior had someone stopped
 purchasing
 (15) or not?
 (16) A Yes sir
 (17) Q Now under this conclusion that the traders think the spill
 (18) will affect consumers purchases you noted that 43 percent of
 (19) the United States traders almost half of them thought that the
 (20) oil spill would eventually affect consumers purchases and
 (21) consumption?
 (22) A Yes
 (23) Q And you noted that of that 43 percent there was a belief
 (24) that consumers fears about safety of eating these products
 (25) will reduced demand for them?

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- (1) A Right
 (2) Q In your reports you make reference to something referred to
 (3) a self fulfilling prophecy will you tell us what that is
 (4) doctor?
 (5) A As I recall as it applied to this particular survey the
 (6) concept would be that if there was an expectation that
 (7) consumption - consumers would reduce demand the trade
 might
 (8) anticipate that in order to not have over stockage of product
 (9) which could sell so therefore they cut their demand at the
 (10) trade level
 (11) Q Now on page Roman numeral ten of the United States
 survey
 (12) you found that 41 percent of those involved in the trade
 (13) believed the spill has affected seafood from certain parts of
 (14) the state and only 14 percent said it had not affected any
 (15) Alaskan seafood?
 (16) A Yes sir
 (17) Q If you would turn to page Roman numeral 14 doctor there
 (18) is a little more I think detail regarding your conclusions
 (19) regarding the trade and would you read the first sentence and
 (20) then the paragraph after it please?
 (21) A The head line?
 (22) Q Yes sir
 (23) A The trades fear that the spill will reduce consumer demand
 (24) because of consumers health concerns can become a self
 (25) fulfilling prophecy If the trade becomes sufficiently worried

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- (1) this is or will happen as a precaution they may reduce their
 (2) purchases on economic grounds for example overstocks
 excessive
 (3) returns et cetera or litigation fears
 (4) Q How do you determine in the surveying profession if
 (5) someone had told you go out and conduct a survey at the end
 of
 (6) 1989 to determine how many of the traders who in effect
 (7) acted upon the self fulfilling prophecy and somehow glean
 from
 (8) them why in effect they either cut purchases or prices how
 (9) would you conduct a survey to determine do that?
 (10) A I wouldn't necessarily even do a survey
 (11) Q What would you do in a situation like that?
 (12) A I'd just monitor the movement of product
 (13) Q If you would turn to arabic number 19 please just so it's
 (14) clear we know what we're talking about we're talking about the
 (15) survey results of consumers the break down of those results
 (16) with respect to questions 6 and 6A on that page?
 (17) A Yes sir
 (18) Q In connection with that question 72 percent of the
 (19) American consumers surveyed in May of 1989 said yes that the
 (20) oil spill has affected seafood from Alaska?
 (21) A Yes
 (22) Q And then you break that down in question 6A that of those
 (23) 72 percent 22 percent believe that seafood all over Alaska had
 (24) been affected?
 (25) A Yes sir

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- (1) Q And 38 percent thought only certain parts of Alaska had
 (2) been affected?
 (3) A Yes sir
 (4) Q And 12 percent knew it was affected but they didn't know
 (5) which areas were affected?
 (6) A Yes sir
 (7) Q In going to the top of page 26 your conclusion there was
 (8) reassurance by the industry that Alaska seafood is safe to eat
 (9) does not evoke great confidence among most consumers and your
 (10) finding was that only 20 percent of those consumers surveyed
 (11) were very confident about industries reassurances?
 (12) A It really should be 26 percent
 (13) Q So 26 percent or just a little over one quarter of those
 (14) surveyed were very confident about the industries reassurances
 (15) as to the safety of Alaskan seafood?
 (16) A Yes
 (17) Q Then if we turn to page 57 please now we're into the
 (18) analysis of survey answers amongst the trade in the United
 (19) States?
 (20) A Yes
 (21) Q And survey question number 5 you were asking those in the
 (22) trade has the oil spill affected seafood from all over Alaska
 (23) only certain parts or not affected seafood from any part of
 (24) the state?
 (25) A Yes

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- (1) Q And only 14 percent of those surveyed in the trade of the
 (2) United States said it has not affected any part of Alaska?
 (3) A That's correct
 (4) Q 16 percent it affected - concluded that it affected
 (5) seafood from all over Alaska?
 (6) A Yes
 (7) Q And 41 percent said it had affected only certain parts from
 (8) Alaska?
 (9) A That's correct sir
 (10) Q And then 19 percent simply didn't know one way or another?
 (11) A Right
 (12) Q We're through with the American survey we can put that
 (13) aside please Let's talk about the Japanese survey if you
 (14) can find that one please Going to page Roman numeral 5 the
 (15) summary of your findings doctor you found that 83 percent of
 (16) those Japanese consumers surveyed were aware of the spill?
 (17) A That's correct
 (18) Q And 50 percent were not eating as much seafood as before?
 (19) A That's correct
 (20) Q And you further found that 58 percent of the Japanese
 (21) consumers surveyed would avoid eating Alaska seafood?
 (22) A That's the finding yes sir
 (23) Q And then 40 percent said outright that they do not believe
 (24) Alaska seafood is safe to eat and another three percent were
 (25) not at all confident that the products were safe?

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- (1) A That's what we reported
 (2) Q Then on page 6 Japanese consumers you concluded that
 the
 (3) assurance by the Alaska seafood industry that its products are
 (4) safe was viewed pessimistically by 48 percent of the Japanese
 (5) consumers while an additional 12 percent weren't sure?
 (6) A That's correct
 (7) Q And then you further found in your survey that the majority
 (8) of Japanese consumers those who were not at all confident
 that
 (9) safe Alaskan seafood would reach the market believed that the
 (10) spill had not been cleaned up to a sufficient degree and the
 (11) profit oriented seafood industry could not be trusted to keep
 (12) consumers interests the upper most?
 (13) A That's what we reported
 (14) Q If you would turn to page Roman numeral eight of the
 (15) Japanese survey There you found that most of the Japanese
 (16) trade was aware of the oil spill?
 (17) A Yes sir
 (18) Q 87 percent of them were aware of the oil spill?
 (19) A Yes sir
 (20) Q And 15 percent had reported they had decreased their
 (21) purchases of seafood?
 (22) A Yes
 (23) VIDEO SPEAKER (inaudible)
 (24) Q Turning to page Roman numeral 9 there your conclusion
 that
 (25) the Japanese trade is split on whether or not the spill will

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- (1) affect consumers purchase consumption of Alaskan seafood products?
 (2) products?
 (3) A Yes
 (4) Q 43 percent of them believe that the spill will affect the consumers is what you found?
 (5) consumers is what you found?
 (6) A Yes
 (7) Q And then you further state that among those who believe that it will impact on consumers purchase consumption more say
 (8) that consumers concerns about safety than anything else will reduce the demand for these products?
 (9) that consumers concerns about safety than anything else will reduce the demand for these products?
 (10) reduce the demand for these products?
 (11) A That s what we reported
 (12) Q Going back to page Roman numeral nine of the Japanese survey you note at the bottom that 63 percent of the Japanese traders believe the spill has affected seafood in certain parts of Alaska and another one percent said it had not affected any of Alaska seafood products?
 (13) survey you note at the bottom that 63 percent of the Japanese traders believe the spill has affected seafood in certain parts of Alaska and another one percent said it had not affected any of Alaska seafood products?
 (14) traders believe the spill has affected seafood in certain parts of Alaska and another one percent said it had not affected any of Alaska seafood products?
 (15) of Alaska seafood products?
 (16) A That s right
 (17) A That s right
 (18) Q So as of June of 1989 only one percent of the Japanese traders surveyed believed that the Spill had not affected any of Alaska seafood products?
 (19) traders surveyed believed that the Spill had not affected any of Alaska seafood products?
 (20) of Alaska seafood products?
 (21) A Just what we ve reported from the survey
 (22) Q And you believe that to be accurate as of June of 1989 is that a fair statement?
 (23) that a fair statement?
 (24) A I believe the survey generated a result that one percent said it had - or they believed it had not affected any of
 (25) said it had - or they believed it had not affected any of

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- (1) Alaska seafood
 (2) Q Go to page 15 I m sorry Roman numeral 15 and would you read under the word trade would you read your conclusion there
 (3) read under the word trade would you read your conclusion there
 (4) and then the paragraph that s indented please?
 (5) A The trades fear that the spill will reduce consumers demand because health concerns can become a self fulfilling prophecy if the trade becomes sufficiently worried this is or will happen and at the present time nearly half believe that it will as a precaution they may reduce their purchases on economic grounds for example overstocks excessive returns et
 (6) cetera or litigation fears
 (7) et
 (8) A That s correct
 (9) Q I think we re clear now you concluded again that the extent of concern amongst Japanese traders in June of 1989 could lead to a self fulfilling prophecy is that a fair statement?
 (10) extent of concern amongst Japanese traders in June of 1989 could lead to a self fulfilling prophecy is that a fair statement?
 (11) statement?
 (12) A That s correct
 (13) A That s correct
 (14) Q Now going to the text of the survey Arabic number 11 with respect to question three of Japanese consumers the findings were that 50 percent of those consumers surveyed indicated that
 (15) that
 (16) they had either decreased or stopped eating certain types of seafood
 (17) seafood
 (18) A That s correct
 (19) A That s correct
 (20) Q And page 14 the conclusion at the top in contrast six consumers in ten 58 percent in parenthesis these are Japanese
 (21) consumers in ten 58 percent in parenthesis these are Japanese
 (22) consumers say that they or other members of their family would
 (23) consumers say that they or other members of their family would
 (24) consumers say that they or other members of their family would
 (25) consumers say that they or other members of their family would

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- (1) not eat seafood from Alaska at the present time?
 (2) A That s what we reported yeah
 (3) A That s what we reported yeah
 (4) Q Now going down to the middle of the page there is a statement that Japanese consumers are unaware of where their
 (5) where the seafood they eat comes from and were not motivated to find out and thus avoid these products Who told you that?
 (6) to find out and thus avoid these products Who told you that?
 (7) A I don t recall
 (8) A I don t recall
 (9) Q And then on page 15 you ll see that only 16 percent of the consumers surveyed indicated that they would eat Alaska seafood?
 (10) consumers surveyed indicated that they would eat Alaska seafood?
 (11) seafood?
 (12) A That s what s reported yes
 (13) A That s what s reported yes
 (14) Q On page 20 page 21 you see that of the consumers surveyed only 13 percent believe that Alaska seafood was safe to eat?
 (15) to eat?
 (16) A That s right
 (17) A That s right
 (18) Q On page 38 of the Japanese survey now we re into questions from the trade the Japanese traders?
 (19) from the trade the Japanese traders?
 (20) A Yes
 (21) A Yes
 (22) Q And you found that 95 percent of the wholesalers were aware of the spill?
 (23) of the spill?
 (24) A Yes sir
 (25) A Yes sir
 (26) Q In terms of breaking down the trade between retailers and wholesalers more Japanese wholesalers were aware of the spill than retailers?
 (27) wholesalers more Japanese wholesalers were aware of the spill than retailers?
 (28) than retailers?
 (29) A That s what we reported
 (30) A That s what we reported

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- (1) MS WAGNER Your Honor tape continues for a little while we ll have a little bit more tomorrow
 (2) while we ll have a little bit more tomorrow
 (3) THE COURT Ladies and gentlemen we ll adjourn for the day at this time Please remember my instructions about listening to or watching anything about our case we will resume at 8 00 tomorrow morning we are adjourned until then
 (4) the day at this time Please remember my instructions about listening to or watching anything about our case we will resume at 8 00 tomorrow morning we are adjourned until then
 (5) listening to or watching anything about our case we will resume at 8 00 tomorrow morning we are adjourned until then
 (6) resume at 8 00 tomorrow morning we are adjourned until then
 (7) (Proceedings recessed at 2 00 p m)
 (8) (Proceedings recessed at 2 00 p m)

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- (1) STATE OF ALASKA)
- (2) Reporter s Certificate
- (3) DISTRICT OF ALASKA)
- (6) I Leonard J DiPaolo a Registered Professional
- (7) Reporter and Notary Public
- (8) DO HERBY CERTIFY
- (9) That the foregoing transcript contains a true and
- (10) accurate transcription of my shorthand notes of all requested
- (11) matters held in the foregoing captioned case
- (12) Further that the transcript was prepared by me
- (13) or under my direction
- (14) DATED this day
- (15) of 1994
- (21) LEONARD J DIPAOLO RPR
- Notary Public for Alaska
- (22) My Commission Expires 2 3 96

Look-See Concordance Report

 UNIQUE WORDS 3,227
 TOTAL OCCURRENCES
 14,332
 NOISE WORDS 385
 TOTAL WORDS IN FILE
 42,166

 SINGLE FILE CONCORDANCE

 CASE SENSITIVE

 NOISE WORD LIST(S)
 NOISE NOI

 INCLUDES ALL TEXT
 OCCURRENCES

 IGNORES PURE NUMBERS

 WORD RANGES @ BOTTOM
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 - \$ -

\$16,670,700 [1] 4845 8
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(1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 (3) In re) Case No A89 0095 CIV (HRH)
 (4)) Anchorage Alaska
 (5) The EXXON VALDEZ) Friday June 24 1994
 (6)) 8 00 a m
 (7) TRANSCRIPT OF PROCEEDINGS
 (8) TRIAL BY JURY 33RD DAY
 (9) BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE
 (10) VOLUME 29 Pages 4914 5115
 Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 8 04)
 (3) THE CLERK All rise
 (4) (Call to Order of the Court)
 (5) THE COURT Good morning ladies and gentlemen This
 (6) is the continuation of trial in case number A89-0095 in re The
 (7) Exxon Valdez I believe we re in the middle of a video
 (8) deposition
 (9) MS STEWART Your Honor before we begin if we could
 (10) read into evidence the defendant s cross examination exhibit
 (11) which the plaintiffs have no objection Would that be
 (12) possible?
 (13) MR O NEILL Yes
 (14) MS STEWART DX2939 DX3283 DX3289 DX3293
 (15) DX3315 DX3327 DX3328 DX3329 DX3330 DX3331 DX3335
 DX3336
 (16) DX3337 DX5120 DX5755 and that s it Defense offer them in
 (17) evidence
 (18) (Exhibits DX2939 DX3283 DX3289 DX3293
 (19) DX3315 DX3327 DX3328 DX3329 DX3330 DX3331 DX3335
 (20) DX3336 DX3337 DX5120 DX5755 offered)
 (21) MR O NEILL We have no objection
 (22) THE COURT The defendant s exhibits just announced
 (23) are admitted
 (24) (Exhibits DX2939 DX3283 DX3289 DX3293
 (25) DX3315 DX3327 DX3328 DX3329 DX3330 DX3331 DX3335

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(1) DX3336 DX3337 DX5120 DX5755 received)
 (2) CONTINUED DIRECT EXAMINATION OF LLOYD KIRBAN
 (3) BY VIDEO EXAMINER
 (4) Q This is the question to the Japanese traders regarding
 (5) their opinions whether the oil spill will have any impact on
 (6) consumers purchase and consumption of Alaska seafood Or
 you
 (7) see that?
 (8) A Yes
 (9) Q And we find that a higher percentage of wholesalers 46
 (10) percent as compared to 41 percent of the retailers believed
 (11) that Japanese consumers purchases and consumption would
 in
 (12) fact decrease or could decrease because of the oil spill?
 (13) A It s what s been reported
 (14) Q Then turning to page 55 this is the question to the
 (15) Japanese traders whether in their opinion has the oil spill
 (16) affected seafood from all over Alaska only certain parts of
 (17) Alaska or not affected any seafood from any part of Alaska
 (18) that s the question and the survey amongst the Japanese
 (19) traders was only one percent of the Japanese traders believed
 (20) that the oil spill had not affected any part of Alaska?
 (21) A That s correct
 (22) Q Doctor if we can visit a little bit about the French
 (23) survey if you would turn please to Roman numeral two It
 (24) indicates that 175 trade interviews were conducted?
 (25) A Yes

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- (1) Q On page Roman numeral three it indicates that the French
- (2) survey was conducted by telephone between May 24th and
- (3) June 9th
- (4) of 1989
- (4) A Yes sir
- (5) Q Turning to page Roman numeral seven that would be the
- (6) summary of your findings?
- (7) A Yes
- (8) Q And you state there under consumers that you found that
- (9) 89 percent of the French consumers were aware of the spill?
- (10) A Yes
- (11) Q And 19 percent indicated they weren't eating as much
- (12) seafood as before?
- (13) A That's correct sir
- (14) Q And you further found that 31 percent of the French
- (15) consumers indicated they would avoid eating Alaska seafood?
- (16) A That's correct
- (17) Q 22 percent said outright that they didn't believe Alaska
- (18) seafood is safe to eat another two percent weren't confident?
- (19) A That's what we reported
- (20) Q Turning to page Roman numeral ten your survey of French
- (21) traders found that virtually all the trade was aware of the oil
- (22) spill?
- (23) A Yes sir
- (24) Q And furthermore with respect to the French 47 percent
- (25) almost half believed that the spill would affect consumers

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- (1) purchases and consumption of seafood referring to the bottom
- (2) paragraph there sir?
- (3) A Yes that's correct
- (4) Q And among those 47 percent who believed that the spill
- (5) would affect consumer purchases there was a belief amongst
- (6) those French traders that the consumers fears about safety and
- (7) eating the seafood products would reduce demand for them?
- (8) A That's what we report
- (9) Q And in the trade the French trade only three percent
- (10) referring you to page Roman numeral 11 believed that the
- (11) Exxon
- (12) Valdez spill had not affected any of Alaska seafood products?
- (13) A That's correct sir
- (14) Q And again you were concerned as you were reporting to
- (15) ASMI was that the French traders concerns that French
- (16) consumers would curtail consumption could in effect become
- (17) another self fulfilling prophecy?
- (18) A That's correct
- (19) Q And your concern was that the French traders may curtail
- (20) their purchases of Alaska seafood in anticipation that French
- (21) consumers would curtail consumption?
- (22) A That's what we reported
- (23) Q We're through with the French survey We can go to the
- (24) survey done in England please This is the last of the four
- (25) surveys right?
- (26) A Yes sir

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- (1) Q And turning to page Roman numeral two it indicates that
- (2) with respect to the trade survey a total of 190 trade
- (3) interviews were conducted?
- (4) A That's correct
- (5) Q And on page Roman numeral three the survey was done
- (6) between May 23rd and June 8th of 1989?
- (7) A That's right
- (8) Q On page Roman numeral five your survey found that 81
- (9) percent of consumers in England were aware of the spill?
- (10) A That's correct
- (11) Q And 11 percent indicated they weren't eating as much
- (12) seafood as before?
- (13) A That's correct
- (14) Q 42 percent indicated they would avoid eating any Alaska
- (15) seafood?
- (16) A That's right
- (17) Q And 31 percent said that they do not believe the Alaskan
- (18) seafood is safe to eat?
- (19) A That's right
- (20) Q On page 1 Roman numeral eight your survey found that 99
- (21) percent of the English trade was aware of the Exxon Valdez
- (22) spill?
- (23) A That's correct
- (24) Q And going to the next page Roman numeral nine your
- (25) survey
- (26) found that more than half 56 percent believed that the spill

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- (1) would affect consumers?
- (2) A That's what we reported
- (3) Q Referring to page Roman numeral 15 there is a discussion
- (4) regarding some of the survey results of the British trade?
- (5) A Yes sir
- (6) Q And there again in this survey as in the Japanese
- (7) American and French surveys you were concerned given the
- (8) large number large percentage of respondents in the trade
- (9) who
- (10) indicated that they believed that the spill would impact
- (11) consumers consumption again you were concerned that this
- (12) would
- (13) be another self fulfilling prophecy?
- (14) A Not on the basis of numbers It's just that the trade
- (15) becomes sufficiently worried
- (16) Q And your findings at that time were that 56 percent of the
- (17) trade in Great Britain were worried?
- (18) A If that's the number I'd have to check it
- (19) Q Just so we're clear I was taking that number from page
- (20) Roman numeral nine
- (21) A Roman numeral nine?
- (22) Q Page Roman numeral nine where it says 56 percent?
- (23) VIDEO ATTORNEY Believe that the spill would affect
- (24) consumers
- (25) BY VIDEO ATTORNEY
- (26) Q Yes
- (27) A Can I draw a distinction?

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- (1) Q Yes
 (2) A 56 percent believed that the spill is not the same thing as
 (3) saying that they are sufficiently worried It simply says that
 (4) 56 percent believe that consumers might but I can't measure
 (5) the intensity with which they are worried about that occurring
 (6) Q But of the traders surveyed 56 percent told the surveyor
 (7) that they believed the spill would impact consumers purchases
 (8) or consumption?
 (9) A That's correct
 (10) Q And what you were telling ASMI then based on the
 (11) percentages found amongst traders in all four of the surveys
 (12) was that it could become a self fulfilling prophecy?
 (13) A It could become a self fulfilling prophecy
 (14) Q And by that what you meant was that buyers believing that
 (15) there may likely be a problem with consumers that the buyers
 (16) would take it upon themselves to reduce their purchases of
 (17) Alaska seafood?
 (18) A That was the interpretation we were drawing
 (19) Q Going to page 15 that's Arabic number 15 Doctor that is
 (20) a breakdown of what looks like question nine of the survey?
 (21) A Yes
 (22) Q Asking the British consumers at the present time that is
 (23) May and June when the surveys were done if seafood were
 (24) identified in some ways coming from Alaska would they refrain
 (25) from eating them?

- (1) seafood do you see that?
 (2) A Yes sir
 (3) Q And 56 percent of the traders believed that it would?
 (4) A Yes
 (5) Q And the breakdown between wholesalers and retailers is
 (6) fairly close 56 percent of the wholesalers versus 57 percent
 (7) of the retailers?
 (8) A That's correct
 (9) Q Going to page 55 the question is posed to the British
 (10) traders whether the oil spill affected seafood from all over
 (11) Alaska only certain parts of Alaska or not affected seafood
 (12) from any part of Alaska?
 (13) A That's right
 (14) Q And only nine percent of the British traders surveyed said
 (15) that it had not affected any part of Alaska?
 (16) A That's what we reported
 (17) MS WAGNER Your Honor that's the end of the
 (18) videotape For the record and to clarify the four reports
 (19) that Doctor Kirban refers to in his deposition are Plaintiffs
 (20) Exhibits 433 434 435 and 436 and all are in evidence
 (21) MS STEWART Your Honor we do have a 17 minute cross
 (22) we need to set up These are excerpts of 2939 which will be
 (23) referred to throughout the cross examination and are pages
 (24) from the summary report that summarizes the survey that Mr
 (25) Kirban was talking about extensively

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- (1) A And the rest of their household
 (2) Q And the rest of their household?
 (3) A Yes sir
 (4) Q And in connection with that question only 31 percent of
 (5) those surveyed indicated that they would eat Alaska seafood?
 (6) A 31 percent would eat it
 (7) Q 42 percent would not?
 (8) A That's correct
 (9) Q Going to page 19 the breakdown in response to the question
 (10) to consumers again British consumers in your opinion has the
 (11) oil spill affected seafood from Alaska do you see that
 (12) Doctor?
 (13) A Yes sir
 (14) Q And only four percent of the British consumers respond to
 (15) that question that no they didn't believe the Exxon Valdez
 (16) spill had affected seafood from Alaska?
 (17) A The oil spill?
 (18) Q The oil spill
 (19) A Yes
 (20) Q Only four percent of those surveyed indicated that it had
 (21) not?
 (22) A Yes sir
 (23) Q Going to page 49 Doctor this is the question whether in
 (24) the opinion of the traders surveyed will the oil spill have
 (25) any impact on consumers purchase or consumption of Alaska

- (1) CROSS EXAMINATION OF LLOYD KIRBAN
 (2) BY VIDEO EXAMINER
 (3) Q I'm going to show you what was marked as Exhibit 3386 in
 (4) prior deposition Mr Kirban and I'll tell you that this is a
 (5) series of four letters from Ms Amlen to Merry Tuten of the
 (6) Alaska Seafood Marketing Institute dated in June and July of
 (7) 1989 and each was identified by Ms Tuten as being a top line
 (8) survey for the four countries that you've mentioned where
 (9) research work was done
 (10) Are these the letters you were just referring to?
 (11) A Yes sir
 (12) Q And I see that you were cc'd on these letters Did you
 (13) review these letters prior to the time they were sent out to
 (14) Ms Tuten?
 (15) A I also was involved in the writing of -
 (16) Q 6 these letters?
 (17) A Yeah
 (18) Q Was the primary conclusion of your survey work that is
 (19) Burson Marsteller's survey work Mr Kirban that the Valdez
 (20) Oil Spill had not affected seafood purchases in these four
 (21) countries?
 (22) A Yes
 (23) Q And do you believe that that's an accurate conclusion as of
 (24) that time?
 (25) A Yes

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- (1) Q And it s for the reasons you just identified with respect
 (2) to the way that the survey was designed and conducted?
 (3) A Yes
 (4) Q Did you also find that as part of your survey work that in
 (5) spite of purchase behavior not being affected that consumers
 (6) did express concern about the Exxon Valdez oil spill and its
 (7) possible impact on the safety of seafood?
 (8) A Yes
 (9) Q How do you explain the apparent disparity between that
 (10) concern and the fact that there was no impact on purchase
 (11) behavior?
 (12) A There are - there are two explanations The one that I
 (13) suspected and we ve included was that inasmuch as Alaska
 (14) seafood was not prominently identified as Alaska seafood the
 (15) consumer would buy seafood not knowing where it s from and
 (16) at
 (17) the same time articulate concern about buying Alaska seafood
 (18) Q You said there were two explanations
 (19) A Yeah The second one is in fact respondents sometimes
 (20) articulate what they think is a socially acceptable response
 (21) and I would imagine that the people we interviewed would
 (22) manifest some concern about eating or feeding their families
 (23) what might possibly be tainted seafood
 (24) Q Have you observed that phenomenon about respondents
 (25) articulating socially acceptable responses in other contexts
 (26) other work that you ve done?

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- (1) A Other work that we ve done and work that s been published
 (2) yes
 (3) Q Could you give some examples?
 (4) A Well I guess the most relevant one currently is the rather
 (5) significant amount of public apparent interest and willingness
 (6) to buy products that are environmentally sound and yet there
 (7) has been significant findings that products that are promoted
 (8) specifically that way don t necessarily have significant market
 (9) success The notion for example of disposable diapers which
 (10) has been raised as a major source of landfill doesn t prevent
 (11) however the disposable diapers being used by parents rather
 (12) than other forms of diapers
 (13) Q So even though people might express concerns about
 (14) landfills and the need to use recyclable things they continue
 (15) to use disposable diapers?
 (16) A Yes
 (17) Q Did you explain these reasons that occurred to you to
 (18) Alaska Seafood Marketing Institute at the time this work was
 (19) done?
 (20) A Yes sir We focused on the first explanation which we
 (21) felt was the strong - reflective of the marketplace realities
 (22) Q Now did you also find that on the retailer or wholesaler
 (23) side that the survey indicated that at least in the four
 (24) countries where you did it that these people had not reduced
 (25) their purchases because of the oil spill?

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- (1) A Yes sir
 (2) Q And how did you explain that - well those retailers and
 (3) wholesalers also expressed concerns about possible spill
 (4) impacts did they not?
 (5) A Yes sir
 (6) Q How did you explain that disparity in the retail or
 (7) wholesale category?
 (8) A Well at the time they were reporting that they themselves
 (9) had not cut their buying behavior The report did indicate
 (10) they were worried that consumers would at some point in time
 (11) perhaps not buy as much Alaska seafood so it was more an
 (12) anticipatory kind of - kind of response on the wholesalers and
 (13) retailers
 (14) Q So it was a concern about something that might happen?
 (15) A Yes sir
 (16) Q Do you know whether in fact there ever came a time when
 (17) consumers reduced or ceased purchasing Alaska seafood?
 (18) A I don t
 (19) Q Did you understand at the time you were doing this research
 (20) work that ASMI the Alaska Seafood Marketing people were
 (21) considering launching if it was necessary launching a major
 (22) multi million dollar public relations campaign to try to
 (23) bolster the image of Alaska seafood?
 (24) A I do recollect some discussion about that
 (25) Q Did you counsel them at all in connection with the decision

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- (1) whether to proceed with a major campaign like that?
 (2) A The only thing we counseled them based on the research
 (3) was not to label at retail the seafood as Alaskan seafood
 (4) Q Why was that?
 (5) A The research indicated that there was no change
 (6) significant change in purchase behavior for the types of
 (7) seafood that Alaska shipped and we were - notwithstanding
 (8) the
 (9) concern that was being voiced by the respondents about the
 (10) possibility of purchasing seafood from Alaska so we counseled
 (11) them to not highlight the fact that the seafood in the retail
 (12) store was from Alaska based on the presumption they didn t
 (13) know where it was and there was really more to be lost than we
 (14) thought to be gained in terms of purchase sensitivity by
 (15) identifying it as Alaska seafood
 (16) Q After you advised them of your research results were you
 (17) aware that ASMI issued press releases stating that consumer
 (18) awareness of the oil spill had not affected purchase behavior
 (19) of seafood?
 (20) A Yes I would only make the statement as of the time we
 (21) did the survey work
 (22) Q Which was May and June?
 (23) A Yes
 (24) Q And as of that time it was correct to say was it not that
 (25) awareness of the oil spill had not negatively affected
 (26) purchases of Alaska seafood in these four countries?

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- (1) A That was our conclusion yes
 (2) Q I m going to turn to Exhibit 3386 The top page is the
 (3) summary related to the U S survey work correct?
 (4) A Yes
 (5) Q And I see in a bold statement in Arabic one towards the
 (6) top of the page -
 (7) A Yes
 (8) Q - where the statement is made on a strictly personal
 (9) behavioral basis that is the American consumer seafood
 (10) purchases patterns it appears that health and safety issues as
 (11) they relate to the Exxon oil spill are not impacting the
 (12) consumers purchase decision
 (13) Was that your primary finding with respect to the U S
 (14) survey work?
 (15) A Yes
 (16) Q And then turning to the second letter which relates to the
 (17) Japan survey work again the number one statement is while
 (18) there is a greater reduction in purchase consumption among
 (19) Japanese consumers than among American French and British
 (20) consumers it is not associated with the Exxon Valdez oil
 (21) spill
 (22) Was that your primary finding with respect to the Japanese
 (23) survey work?
 (24) A Yes
 (25) Q And then turning to the third letter which relates to the

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- (1) British survey work the statement at number one is Concerns
 (2) about health and safety issues related to the Exxon Valdez oil
 (3) spill are not impacting British consumers purchase decision
 (4) Was that your primary findings with respect to the British
 (5) research?
 (6) A Yes sir
 (7) Q And then finally the fourth letter related to the French
 (8) research work The statement is made at number one It
 (9) appears that concerns about health and safety issues related to
 (10) the Exxon Valdez oil spill are not impacting French consumers
 (11) purchase decisions
 (12) Was that the primary finding of your French research?
 (13) A Yes
 (14) Q Now the timing of these surveys we talked about them
 (15) being done in May and June of 1989?
 (16) A (Indicating)
 (17) Q Was that ASMI s determination that when they came to you
 (18) you were conducted they wanted the surveys done either
 (19) immediately or as soon as possible?
 (20) A That was my understanding
 (21) Q You indicated earlier I believe that you believed that
 (22) the disparity or inconsistency between the fact that consumers
 (23) were aware of the spill and had concerns about health but
 (24) apparently hadn t curtailed their buying was the fact that
 (25) they hadn t made the link as to where particular seafood was

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- (1) caught?
 (2) A That they were seeing at the retail level yes sir
 (3) Q Now the statement that you don t believe that consumers
 (4) made the link that seafood isn t necessarily identified as from
 (5) Alaska what is the factual basis of that statement Doctor?
 (6) A I would based upon the conclusion I would assume we ha
 (7) asked the question of ASMI if it was - if their seafood was
 (8) identified and received a response it wasn t
 (9) Q Mr Kirban Mr Nolting asked you a number of questions
 (10) about the various final survey reports and went into a lot of
 (11) detail about who answered and what percentage answered to
 (12) what
 (12) questions I want to get back to the sort of the bottom line
 (13) of these various reports
 (14) Am I correct that your principal conclusion that you
 (15) reported to ASMI as to each of these four countries that is
 (16) France United Kingdom United States and Japan was that
 (17) purchase behavior of consumers and traders had not been
 (18) affected by the Exxon Valdez oil spill?
 (19) A That s correct as of the time this work was completed
 (20) Q Now I want to ask about how this questionnaire was put
 (21) together What seafoods do you eat in your household and
 (22) what
 (22) seafoods have you eaten in the last couple months Is that
 (23) generally where you started?
 (24) A Yes sir
 (25) Q And then you asked consumers if there was a decrease - y

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- (1) then asked them have you increased decreased or stopped
 (2) eating
 (2) completely these type of seafoods?
 (3) A Yes sir
 (4) Q And then after you found out whether or not people had
 (5) decreased you asked them reasons for decreasing their or
 (6) stopping eating their seafood?
 (7) A Yes sir
 (8) Q Let me ask you this The survey on its second page at
 (9) question three reads as follows Now I d like to read you a
 (10) list of seafood again and this time I d like you to tell me if
 (11) you or anyone in your household has increased decreased or
 (12) stopped completely eating the following types of seafood And
 (13) then you go through the list That s the question that was
 (14) asked was it not?
 (15) A Yes sir
 (16) Q And one possible response on the questionnaire form is
 (17) increased correct?
 (18) A That s correct
 (19) Q And am I correct that when people answered increased th
 (20) was recorded on this form by the surveyor?
 (21) A Yes sir
 (22) Q Now you did not ask the reason if somebody answered
 (23) increased?
 (24) A If they said that we didn t follow up
 (25) Q Why not?

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- (1) A It wasn't relative to the purpose of the research
- (2) Q ASMI was interested in decreasing or stopping?
- (3) A Yes
- (4) Q So that's what you followed up on?
- (5) A That's correct
- (6) Q And am I correct that essentially all of the people who
- (7) said that they had decreased or stopped eating seafood gave
- (8) reasons other than the oil spill for that?
- (9) A There are other reasons volunteered yes
- (10) Q But your conclusion was that the oil spill was not a
- (11) significant factor?
- (12) A That's correct sir
- (13) Q Then after you went through these neutral questions or
- (14) unaided questions at five you introduced the notion of the oil
- (15) spill correct?
- (16) A Yes sir
- (17) Q Why did you start out with these neutral questions and then
- (18) go into the oil spill afterwards?
- (19) A For the reasons that I mentioned earlier that we were
- (20) concerned that if we had put the questions about the oil spill
- (21) first it might have affected our jargon biased the responses
- (22) by the individuals
- (23) Q Well you indicated in your report did you not that
- (24) origin of seafood and lack of awareness of geographic origin
- (25) was a factor causing people to continue to buy seafood in spite

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- (1) of these concerns?
- (2) A My recollection is we made such an observation
- (3) Q Did you believe in fact that's a factor?
- (4) A If we've included it we thought it was a factor
- (5) Q And am I also correct that you also believed there is a
- (6) phenomena at work when consumers answer surveys like this
- (7) of wanting to give politically correct or environmentally
- (8) conscious responses?
- (9) A I would rather use the word socially correct
- (10) Q Socially correct?
- (11) A Yeah
- (12) Q But the gist of it is they want to sound rational and
- (13) sensitive?
- (14) A That's correct
- (15) Q Given all of those questions that Mr Nolting put to you
- (16) about the substantial numbers and percentages of people
- (17) being concerned or lacking confidence or being unwilling to eat
- (18) Alaska seafood does any of that alter your belief as expressed
- (19) earlier this morning that in fact purchase behavior of
- (20) consumers and traders was not affected by the Valdez Oil Spill
- (21) based on your research as of the time these reports were
- (22) prepared?
- (23) A That's correct
- (24) Q None of that alters your belief in that regard is that
- (25) correct?

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- (1) A No
- (2) MS STEWART That concludes our cross examination
- (3) MR JAMIN Your Honor Plaintiffs call Dr Phillip
- (4) Mundy to the stand
- (5) THE CLERK Raise your right hand please
- (6) (The Witness Is Sworn)
- (7) THE CLERK Please be seated For the record sir
- (8) state your full name your address and spell your last name
- (9) please
- (10) THE WITNESS My name is Dr Phillip with two L s
- (11) R Mundy M U N D Y I reside at 1015 Share Lane Lake
- (12) Oswego
- (13) Oregon
- (14) DIRECT EXAMINATION OF DR PHILLIP MUNDY
- (15) BY MR JAMIN
- (16) Q Sir are you currently employed as a consultant?
- (17) A Yes I am
- (18) Q And are the two principal issues you're focusing on now the
- (19) recovery of Columbia River basin salmon and the effect of the
- (20) Exxon oil spill on salmon?
- (21) A That's correct
- (22) Q And in the former capacity with respect to Columbia River
- (23) basin salmon are you working with the United States Fish &
- (24) Wildlife Service the Bonneville Power Authority the Yakima
- (25) Indian Nation and the Nez Perce Tribe of Native Americans?

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- (1) Q And with respect to the second issue are you working with
- (2) the NRDA Trustees and specifically the Alaska Department of
- (3) Fish & Game?
- (4) A Yes I am
- (5) Q Apart from your work for the Trustees have you done
- (6) research in Alaska fisheries?
- (7) A Yes I have
- (8) Q And has that been every year since 1976 sir?
- (9) A That's right
- (10) Q Let's take a moment to look at your education Did you
- (11) receive a bachelor of science in zoology from the University of
- (12) Maryland?
- (13) A Yes
- (14) Q And a master of science from the University of Alabama
- (15) Tuscaloosa?
- (16) A Yes
- (17) Q And a Ph D from the University of Washington in Seattle?
- (18) A That's right
- (19) Q And was your thesis on the timing and management of the
- (20) Bristol Bay salmon fishery?
- (21) A That's right
- (22) Q Let's get where you worked for ADF&G Did your first work
- (23) in Bristol Bay on sockeye salmon returns?
- (24) A That's correct
- (25) Q Did that include studies of migratory timing and migratory

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- (1) behavior?
 (2) A Yes
 (3) Q In 1977 through 1988 continue to work in Bristol Bay and
 (4) work as well in the Upper Cook Inlet?
 (5) A That s right
 (6) Q And was it during this time sir that you continued or
 (7) completed your dissertation?
 (8) A Yes
 (9) Q And was the thesis work that you did later applied in your
 (10) work for the Alaska Department of Fish & Game?
 (11) A Yes that was a big part of my work for ADF&G
 (12) Q After 1980 did you continue to work for the Alaska
 (13) Department of Fish & Game in the Yukon Kuskokwim and more
 (14) in Bristol Bay and Upper Cook Inlet?
 (15) A Yes that s right
 (16) Q And were the concepts you developed in your dissertation
 (17) incorporated into the management plans for the Alaska
 (18) Department of Fish & Game?
 (19) A Yes
 (20) Q In 1985 through 1987 what position did you hold sir?
 (21) A 1985 through 1987 I worked for the State of Alaska as a
 (22) chief fishery scientist for the Division of Commercial
 (23) Fisheries
 (24) Q Was this transition - did you have responsibility for
 (25) science in all the fisheries of the state?

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- (1) A That s correct
 (2) Q After 1987 have you continued to work on Alaska fisheries
 (3) including work on Upper Cook Inlet run reconstruction and
 (4) Upper Cook Inlet management?
 (5) A Yes I have
 (6) Q In 1990 were you engaged by the justice department to
 (7) decide what sorts of research should be done in the wake of the
 (8) Exxon Valdez oil spill to determine its effects on fish and
 (9) shellfish?
 (10) A Yes That was in the fall of 1989
 (11) Q Did you work on the design of those studies?
 (12) A Yes
 (13) Q Did you work on peer reviewing those studies?
 (14) A Yes
 (15) Q Did those studies include all of the shellfish and
 (16) groundfish studies including those relating to pink salmon and
 (17) red salmon?
 (18) A Yes that is right
 (19) Q Do the Trustees continue to employ you to this day sir?
 (20) A Yes
 (21) Q When did your work begin for Plaintiffs in this case?
 (22) A I first started working for Plaintiffs I think it was in
 (23) February late February of 1993
 (24) Q Between 1980 and 1982 were you employed as an assistant
 (25) professor of biological oceanography in the Department of

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- (1) Oceanography at Old Dominion University?
 (2) A Yes
 (3) Q Between 1982 and 1984 were you employed as associate
 (4) director of fisheries at the Applied Marine Research
 (5) Laboratory?
 (6) A Yes
 (7) Q Between 1984 and 1985 were you an associate professor of
 (8) fisheries at the school of fisheries in Juneau?
 (9) A Yes that s right
 (10) Q During the time you had teaching responsibility did you
 (11) teach both graduates and undergraduates?
 (12) A Yes I taught primarily graduate students but I also
 (13) taught some undergraduate
 (14) Q Focusing on graduates did you teach fisheries management
 (15) and fisheries mathematics?
 (16) A Yes
 (17) Q With respect to the fisheries management course did that
 (18) include topics on the role of the ecosystem on the productivity
 (19) of fisheries?
 (20) A Yes Since it was in the Department of Oceanography they
 (21) wanted me to put emphasis in marine ecology in teaching
 (22) fishery management
 (23) Q With respect to fishery mathematics what is that?
 (24) A Well we try to find mathematical models and statistical
 (25) models that help them make sense out of their fisheries data

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- (1) that help them describe a little more precisely the kinds of
 (2) things they are seeing so they can do things like write fishing
 (3) regulations and justify those to the public
 (4) Q And in that course did you call upon your experience with
 (5) salmon to use it as one of the examples?
 (6) A Yes Yes One reason I got the job teaching in the
 (7) Department of Oceanography they wanted somebody with
 (8) hands on
 (9) experience and at that time I had quite a bit of experience in
 (10) managing fisheries and they wanted somebody who could give
 (11) some real life experience to graduate students
 (12) Q And with respect to undergraduates did you also teach
 (13) marine biology?
 (14) A Yes I did
 (15) MR JAMIN Your Honor without further ado I ask
 (16) that Dr Mundy be certified as a specialist in fisheries fish
 (17) population biology management and fish population
 (18) dynamics
 (19) MR COOPER No objection Your Honor
 (20) THE COURT Dr Mundy s qualifications are accepted
 (21) BY MR JAMIN
 (22) Q Dr Kocan told us how science works through observation
 (23) and
 (24) science works through testing hypotheses and science works
 (25) through synthesis of others work Have you done work in all
 (26) three of these areas?
 (27) A Yes
 (28) Q And which of these three types of science has dominated

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- (1) your work in the last few years?
- (2) A Well at this point in my career generally agencies are
- (3) interested in putting lots of different kinds of data together
- (4) and synthesizing different kinds of data to solve problems We
- (5) have people out collecting data that - out analyzing data but
- (6) trying to pull that into a big picture is not always easy and
- (7) that's a real important part of an agency's ability to spend
- (8) its money effectively to get the most out of every dollar
- (9) having the big picture
- (10) So I generally work in an area of synthesis where I pull
- (11) together studies that have been done by other people and
- (12) basically try to figure out what the most effective approach is
- (13) for the future
- (14) Q Before we get specifically into the damage to salmon caused
- (15) by the spill I want to lay a little bit of a background into
- (16) the areas of - understanding we need to understand what has
- (17) happened and I want to focus a little bit on some issues that
- (18) Mr Parker raised with us about life cycles of both pink and
- (19) red salmon
- (20) And let me start sir if - is the concept of a spawner
- (21) recruit relationship important in the management of fisheries?
- (22) A Yes I think the concept of a spawner recruit relationship
- (23) is probably one of the most important things that we've learned
- (24) in the last 150 years and it may be the only thing that we
- (25) really have to justify our fishing regulations on

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- (1) Q Can you explain what the concept is to the jury?
- (2) A Well back in the early days of salmon management back in
- (3) the 1880s we weren't sure that salmon came back to their home
- (4) stream to spawn And there weren't any fishing regulations
- (5) essentially in those days people just kind of fished and when
- (6) they got enough salmon they quit fishing
- (7) Through the years through trial and error we learned that
- (8) salmon do generally come back to their home stream to spawn
- (9) Not always but most of the time And we also learned that
- (10) spawning grounds have a certain capacity to hold salmon If
- (11) you put too much salmon on the spawning grounds they
- (12) interfere
- (13) with one another and you lose production
- (14) We also found that it's not just the spawning grounds that
- (15) count but sometimes the young fish will rear in lakes or
- (16) streams And even if you've got enough spawning capacity if
- (17) you put too many juvenile fish into the lakes or streams you're
- (18) going to lose production as well
- (19) Now where the biology of the term spawner comes into the
- (20) real world as a practical matter it's that return for spawner
- (21) relations that determine how many fish we can let the
- (22) commercial harvesters take each year which is important to
- (23) them in making a living
- (24) So we worked over the years very hard trying to make an
- (25) idea of how many fish we should put on the spawning grounds
- and
- (25) approximately how many adults in the next generation and

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- (1) that's usually from two to five years later on we're going to
- (2) get back for putting that many recruits for spawners on the
- (3) spawning ground
- (4) So this is called a return per spawner the fish produced
- (5) in the future So it's called a return per spawner
- (6) relationship
- (7) Q Now the spawner then is the fish that's coming into the
- (8) stream or into the lake to deposit eggs and the recruit is how
- (9) many come back after a life cycle per spawner?
- (10) A That's right
- (11) Q Now how do you decide as a fish manager or as a manager
- (12) of
- (13) fisheries how do you decide how many fish to allow into the
- (14) stream or into the lake?
- (15) A Well as I indicated earlier it was initially based on
- (16) trial and error just to get some rough idea of what - how many
- (17) fish we should put on the spawning grounds We simply kept
- (18) track of the numbers that were going up the river do that by
- (19) various measures and how old they were because it's
- (20) important
- (21) that any fish showing up in any one year could have been born
- (22) two three four five even six years previously So we got
- (23) to keep track of how old they are and how many are going up
- (24) the
- (25) river
- (25) And we simply sit down and match those numbers up We look
- (25) at how many recruits the spawners in 1976 produced how
- (25) many
- (25) recruits the spawners in 1977 produced and we just plot it out

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- (1) on a graph and we take a look at how it falls out That's the
- (2) basic idea
- (3) Q Now I think you started to mention that it's possible to
- (4) have too many fish come into a stream or a lake that supports
- (5) the fish?
- (6) A Yes If we get too many fish on the spawning grounds they
- (7) will interfere with one another even if some system or
- (8) capacity is not set by the spawning grounds but also by the
- (9) amount of space and food we have for the juveniles after they
- (10) hatch and come out
- (11) Q Is that concept called overescapement?
- (12) A Yes
- (13) Q Now if there isn't enough food for the young fish what
- (14) does that mean for those fish?
- (15) A Well generally what happens when you don't have enough
- (16) food there is the concept that says that the big get bigger
- (17) and the ones that stay small die Generally the - initially
- (18) you'll find a big difference in size between fish That's a
- (19) first indication because the big fish are getting all the food
- (20) and the small ones aren't and the fish that don't get any food
- (21) die so you wind up with an overall for the population as a
- (22) whole with a lower survival
- (23) Q Now does this concept of overescapement vary from
- (24) species
- (25) to species? And we want to focus on pink and red salmon
- (25) A Yes Salmon have different kinds of life cycles They

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(1) have different ways of dealing with the environment just like
 (2) people do and so whether or not their population would be
 (3) sensitive to overescapement depends on the kind of fish they
 (4) are Generally salmon that have a complex life cycle that
 (5) have a lot of different parts to their life cycle would be
 (6) more sensitive to overescapement than salmon that have a
 (7) simpler life cycle
 (8) Probably the simplest is the pink salmon That s the
 (9) easiest one to understand They have got a two year life
 (10) cycle All the adults are just two years old We don t have
 (11) to spend much time trying to figure out how old they are That
 (12) makes it easy for us And they don t seem to be as sensitive
 (13) to overescapement as an animal like the sockeye
 (14) The sockeye these animals mature at four five six
 (15) sometimes seven or eight years old They spawn in streams
 that
 (16) are associated with lakes and the young grow up in lakes and
 (17) they will spend one two and even three years in a lake before
 (18) they go out to sea When they get out to sea they will spend
 (19) from one to three years in the sea and come back to spawn So
 (20) sockeye can suffer from overescapement by having too many
 (21) spawners on the spawning grounds but they can also suffer
 from
 (22) overescapement if there is enough room if you actually
 produce
 (23) too many juveniles and you put too many juveniles in the lakes
 (24) because once the food in the lake is gone the fish start to
 (25) die pretty fast

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(1) Q Now for pink salmon what is the importance of the
 (2) near shore ecosystem?
 (3) A Well pink salmon unlike sockeye don t get much of a head
 (4) start when they hit the manne environment When they absorb
 (5) their yolk sac and are ready to pop up out of the gravel they
 (6) head down the stream fairly quickly and combine up in a marine
 (7) area near the stream mouth
 (8) Now this is about the first chance they get to eat much
 (9) and it s real important for them to basically have a good
 (10) breakfast when they hit the sea They have got to get going
 (11) because if they don t grow then they wind up getting eaten by
 (12) everything So the faster they are to grow the less likely
 (13) they are to be eaten
 (14) So a near shore environment for an animal like a pink
 (15) salmon that doesn t have a chance to eat before it hits the sea
 (16) is real important
 (17) Q So for the red salmon once they absorb their yolk they
 (18) are in the lakes and the pink salmon when they consume their
 (19) yolk sac they get into this near shore ecosystem?
 (20) A Right
 (21) Q Now I m going to sir ask you for a series of expert
 (22) opinions today but let me ask you if in conjunction with your
 (23) testimony you ve reviewed a series of the Trustees studies
 (24) with respect to fish?
 (25) A That s correct

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(1) Q And have you reviewed a series of ADF&G documents
 relating
 (2) to this area?
 (3) A Yes I have
 (4) Q And have you reviewed specifically some work that a Mr
 (5) Geiger and others have done for the Trustees?
 (6) A Yes
 (7) Q And have you also talked with ADF&G personnel regarding
 the
 (8) impacted fisheries?
 (9) A The impact of the oil spill on fisheries yes
 (10) Q And do you bring the full range of your own experience to
 (11) your opinions?
 (12) A That s right
 (13) Q Let s talk for a bit first about the Upper Cook Inlet
 (14) fishery and can you start by describing to us what the
 (15) Trustees fish and shellfish study number 27 set out to
 (16) determine? And I think I have a document that may help
 (17) This is counsel Exhibit 775 This should come up on the
 (18) screen momentarily
 (19) A Fish and shellfish study 27 was done by a lot of different
 (20) people but the two primary authors were Ken Tarbox and Dan
 (21) Schmidt So I don t like using numbers as well as the people
 (22) who did the work so I ll call this the Tarbox study because
 (23) he was the person who started the study
 (24) Initially when we were considering the problem of
 (25) overescapement in Cook Inlet we were concerned that the

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(1) overescapement into the Kenai River system - the adult
 (2) sockeye so many come in where I ve drawn the arrow That s
 (3) Cook Inlet To the north of that arrow is Anchorage and to the
 (4) south of that arrow is the Gulf of Alaska And the adult
 (5) sockeye salmon come into the Kenai River and spawn in a lot o
 (6) different places but mostly in the river system associated
 (7) with Skilak Lake which is the lake that I ve drawn the red
 (8) circle around there
 (9) The studies that were done in fish and shellfish 27 by
 (10) Tarbox basically involved looking at everything that we could
 (11) afford to measure that would tell us whether or not we had put
 (12) too many fish on the spawning grounds or we put too many
 (13) juveniles into the lake as a result of the overescapement in
 (14) 1989 In 1989 the management program wasn t able to use the
 (15) drift fleet because of the fear of oiling of the gear They
 (16) were able however to use the - some of the gear which is
 (17) known as setnets of fishes on the beaches
 (18) The drft fleet in Upper Cook Inlet is probably the most
 (19) powerful tool that the managers have for adequately harvestinc
 (20) the run Generally for most of the systems including the
 (21) Kenai River unless you ve got the drft fleet operating you
 (22) can t adequately harvest the run and generally if you have a
 (23) big run you re going to get a substantial overescapement if
 (24) you don t have all the tools available
 (25) Q Now did Mr Schmidt and Tarbox focus on the deposition of

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- (1) eggs and fry at all?
 (2) A Yes They - one of the things that they did was survey
 (3) the areas where the fish spawned and they got an estimate of
 (4) how many eggs were deposited and they looked at the -
 (5) whatever historic data they could find to try to see if they
 (6) had a relationship between how many eggs were going in the
 (7) gravel and how many fry were showing up in the lake and they
 (8) found that they did
 (9) Q Did they study the growth of the fish and fat content
 (10) issues such as that?
 (11) A Yes One of the things that tells you whether or not the
 (12) fry in the lakes are doing well whether they are going to make
 (13) it or not is first of all how well they grow how fast they
 (14) grow but how much fat they have in the fall because in the
 (15) wintertime they are not eating and they have to depend on how
 (16) much fat content they have in their body to make it through the
 (17) winter if they don't have enough food in the summer and they
 (18) go into the fall without enough fat then generally they will
 (19) die
 (20) So they studied both the growth of the fry and the amount
 (21) of fat they had in their bodies
 (22) Q And did the gentlemen use another river system for
 (23) comparison purposes?
 (24) A Yes To the south of the Kenai River fairly nearby is
 (25) another system called the Kasilof and you go over that river

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- (1) on the way down to Homer if you were driving and the big
 (2) rearing lake on the Kasilof is the Tustumena and it has
 (3) characteristics that are similar to Skilak It's the same sort
 (4) of a lake
 (5) Now the thing that was convenient for Fish & Game in doing
 (6) this study about Tustumena was the Kasilof fish have a
 (7) different way of coming up in the Cook Inlet than most of the
 (8) other sockeye salmon in that they tend to hug the shore a lot
 (9) more And that's where the sets are so as the Kasilof fish
 (10) came in they were caught a lot more frequently in the setnet
 (11) than were the Kenai fish The Kenai fish stay offshore and
 (12) make a mad dash for the river so they are only on shore where
 (13) the setnets can get at them a very short time
 (14) So the Kasilof didn't experience the kind of overescapement
 (15) that they saw in the Kenai so the scientists like to call this
 (16) thing a control that is we've got one thing that's been
 (17) treated and one thing that hasn't and we try to compare the
 (18) two I think Lake Tustumena is a good comparison for the
 (19) Skilak Lake to compare the effects of normal escapement
 (20) versus
 (21) overescapement in these two sockeye systems
 (22) Q Now what did Mr Schmidt and Tarbox find with respect to
 (23) smolt production from 1989 smolt production escapement in
 (24) this
 (25) Skilak/Kenai Lake system?
 (26) A Basically they found that the number of smolt - and that's
 (27) the life stage where they are making the transition from fresh

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- (1) water to salt water A smolt is a different kind of animal
 (2) from a fry because it's changed and it's adapted to take the
 (3) shock of entering the saltwater
 (4) They found that the number of smolts that were produced by
 (5) the very large escapement was over one and a half million
 (6) sockeye in 1989 but was extremely small They had a very low
 (7) production of the smolt however they had produced a lot of
 (8) fry
 (9) Q Let me show you what's been marked Exhibit 332 and that
 (10) should come up momentarily and if that helps you as a
 (11) demonstrative tool sir -
 (12) A If it's okay with the jury perhaps I could just point with
 (13) this pointer
 (14) Q Sure Please do that
 (15) A This is the goal right here They typically would like to
 (16) get 400 000 to 700 000 of sockeye in the Kenai system and
 (17) that's what they shoot for as a rule They don't want the
 (18) escapement to get much above 700 000 and for - to avoid the
 (19) effects of overescapement and they don't want to get much
 (20) below 400 000 So the low end is set by how much they need
 (21) for
 (22) the fishery and the upper end is to avoid damage to the
 (23) system This is the number that actually showed up on the
 (24) spawning grounds right here about 1.6 million so it was a
 (25) good deal higher than the upper end of the goal
 (26) Q Now did Misters Tarbox and Schmidt find any difficulty

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- (1) with the fry in the Skilak and Kenai Lake system from the 1989
 (2) overescapement?
 (3) A Well there was no problem with the numbers produced The
 (4) numbers produced were pretty much consistent with the
 (5) spawning
 (6) which you would expect from the spawning so the - apparently
 (7) the spawning grounds in the Kenai system were not limiting
 (8) production but when they examined the growth particularly the
 (9) fat content in the fry the next fall that would have been the
 (10) fall of 1990 they were very concerned about the ability of
 (11) those fry to make it through the winter alive And
 (12) subsequently when they measured these fry in the fall of 1990
 (13) as smolts in the spring of 1991 they got a lot of fry that
 (14) went into that winter but very few smolts came out in the
 (15) spring
 (16) Q Let's take a look at the exhibit which has been marked
 (17) 322 So as I understand it in 1990 there was a very
 (18) substantial escapement as well but there were problems with
 (19) the fry too?
 (20) A Yes In this graphic here this is 1987 but you have to
 (21) notice - let me explain just a little bit about the graphs so
 (22) that you can get the feel for it
 (23) This is the number that escaped in 1987 up here
 (24) Q That's before the spill sir?
 (25) A Yes just as an example So this actually occurred in
 (26) 1987 This green bar here all right is the number of fry

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(1) that was produced by that escapement in 1987 Now that green

(2) bar happened in 1988 okay and then this brown bar here is the

(3) number of smolt the next life history stage that came out that

(4) have spawned and that would have been in - two years beyond

(5) 1987 That would have been 1989

(6) So in looking at that graphic you have the solid line that

(7) shows you the escapement and that s the escapement shown on

(8) the X axis and then the green bar that shows the number of

(9) young fish the following year the fry that were produced by

(10) that number of spawners And then the brown bar is ultimately

(11) what went out to sea resulting from that escapement So you

(12) have three years of data summarized in this one column of

(13) figures here

(14) Now you can see that the 1987 escapement produced a pretty

(15) substantial number of smolts also produced a very good run

(16) five years from 1987 1989 you had an escapement that was

(17) above the optimum but still it produced a normal number of fry

(18) and a pretty good level of smolt production Here in 1989 we

(19) had an escapement that was comparable to what we saw in 87

(20) The fry production was pretty good off of that

(21) But this is the problem right here The smolt production

(22) from the 1989 escapement as measured in 1991 was very very

(23) small You can see that the - from one and a half million

(24) spawners here in 1989 we got this number of smolts

(25) (indicating) and that was less than was produced by this

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(1) escapement which was much smaller the preceding year in

(2) 1988 So we got a very small production of smolts out to sea

(3) from the 1989 brood year

(4) Q So if I understand this correctly the ratio between the

(5) brown bar and the green bar in 1989 and 1990 is small and

(6) that s the concern that you re talking about?

(7) A That s right The number of smolts that we re producing in

(8) the spring from the fry that go into the winter and the fall

(9) the preceding fall is just not there We just don t have the

(10) production Something has happened in that lake system As a

(11) management biologist I think this is a perfect example of why

(12) we have escapement goals and why we can justify telling the

(13) fleet that it s time to stop fishing they can t make any more

(14) money we have the put the fish up the river and how we can

(15) justify to say that the fleet can take fish this natural

(16) resource belongs to everybody Because by using escapement

(17) goals and management we can moderate the production from the

(18) system so that everybody gets some benefit out of it

(19) Q Now do I understand correctly that Mr Schmidt and Mr

(20) Tarbox have found that the fry or the fry production is a

(21) function of too much fish in the environment in those lakes?

(22) A Well they also in addition to studying the condition of

(23) the fry and the number of spawners and so forth in the

(24) spawning grounds they have done quite a bit of work that s called

(25) limnology And limnology is basically fresh water

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(1) oceanography it s the study of lakes and productivity

(2) And they have looked at the plankton the small animals in

(3) the water column that the young sockeye depend on for food and

(4) they have found some changes in the that zooplankton that th

(5) believe are indicative of the overescapement that indicate that

(6) there are too many juvenile fish in the lake for the - to be

(7) able to support that number of juveniles

(8) Q Let s take a look sir next at Exhibit 319 and see how

(9) the overescapement pattern works over the years

(10) A Again I just want to take a little bit of time so that we

(11) can be sure what we re looking at here These green and blue

(12) bars here are not what happened okay? The green and blue

(13) bars are not what happened They are just there to show you what

(14) the escapement goal was in that particular year okay?

(15) So the blue bar there gives you the range of what they

(16) wanted and you can notice that over the years starting back

(17) in 1970 and progressing forward that goal has been coming t

(18) as we ve learned about the system

(19) Remember I said that setting the escapement goal and return

(20) for spawners is a matter of trial and error? This is something

(21) we learn as we go Also this is something we believe that the

(22) conditions in the marine environment in a lot of areas have

(23) gotten very good since about 1980 and you can see the resul

(24) of that is that we have raised the escapement goals and the

(25) production has gotten pretty good But one thing you have to

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(1) be careful about in looking at escapement numbers is that the

(2) escapements don t necessarily correspond to runs although

(3) they

(4) may But the fleet is out there the fleet fishes on these

(5) runs and if they catch a lot of them then you can have a

(6) great big running and a small escapement So how much the

(7) catch determines how much in escapement

(8) So we see this first big peak 1987 was a real big run and

(9) they got a real big escapement off of it and they had some

(10) problems in the management in that year Over here the

(11) following year there is some changes in the management

(12) program

(13) in 1988 and they also had a little bit of a problem

(14) controlling the escapement 1989 as I indicated you can see

(15) they couldn t use the drift fleet so they couldn t control the

(16) escapement so they got another big escapement

(17) Note that this peak over here in 92 doesn t mean that

(18) things are getting better That s just the run that was

(19) produced by 1987 The fish that spawned in 1987 most of the

(20) came back in 1992 They produced really well This big

(21) escapement here doesn t appear to have damaged the lake

(22) because it produced a very big run over here in 1992 and aga

(23) they had a little bit of trouble controlling the escapement

(24) the bigger the run the harder to control the escapement even

(25) if you have all your tools in operation

(1) Q Now Dr Mundy you started to talk about it a bit this

(2) 87 overescapement Is it your opinion that that s what s

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(1) creating the problems in 1989 with this lower smolt situation?
 (2) A No I don't think so There are a couple of reasons I
 (3) don't think that the overescapement in 1987 should have been a
 (4) problem if they had been able to return to normal escapements
 (5) if they had their tools First of all if the 1987 fish had
 (6) competed with themselves that is if there wasn't enough food
 (7) there for the fish to eat in 1987 then they wouldn't have
 (8) produced that big run in 1992 okay?
 (9) They produced a lot of smolts okay? We're back to the
 (10) other graph You can see that 1987 run See that 1987 run
 (11) produced a lot of smolts? That brown bar is quite tall They
 (12) were really surprised because that was a big escapement and
 (13) we
 (14) felt that the fish would compete with one another and not do as
 (15) well however apparently things were good in the lake at the
 (16) time those young fish were there They produced a very big run
 (17) in 1992 That's over and we know what happened
 (18) In 1988 we were very concerned because they were again
 (19) above the escapement goal They were on the high side Not
 (20) as
 (21) high as 1987 but we felt that we were by the worst the 1987
 (22) escapement maybe that we had gotten off lucky on that one
 (23) because the 1988 fish had good survival They produced a
 (24) good
 (25) number of fry and they produced a good number of smolts and
 a
 (26) pretty good run
 (27) So the - we felt the worst was past us with that however
 (28) the - when the 1987 fish came in you can see there pretty

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(1) graphic what happened
 (2) Q Is that the 1989 fish?
 (3) A I'm sorry 1989 fish I'm sorry The 1989 fish that big
 (4) escapement even a little bit smaller than 1987 produced a
 (5) small number of smolts So apparently the escapement in
 (6) 1989
 (7) the fish did not get enough to eat in the lake system they did
 (8) not make it through the winter and we got a very very low
 (9) production of smolts relative to that number of spawners In
 (10) fact that's a low production of smolts period I mean that
 (11) would be - if we only had an escapement of 700 000 that would
 (12) be a very very small number of smolts produced from even
 (13) 700 000 fish
 (14) Q Now let's get an idea of the consequences of what
 (15) happened
 (16) in 1989 and you've explained how that's different from '87 and
 (17) '88 Is it your opinion that there will be fewer sockeye
 (18) salmon for commercial fishermen to harvest in 1994 and 1995
 (19) because of these low smolt returns from the '89 and '90 runs?
 (20) A Yes that's right
 (21) Q Can you explain how that works sir?
 (22) A The reason that we try to avoid overescapement in sockeye
 (23) systems is that as we saw in 1987 once in a while you can get
 (24) away with big overescapement and it may not be that serious
 (25) but if you get a big a escapement and it knocks the food base
 down and we've studied this in a lot of different lakes in
 (26) Alaska then you have a problem that lasts for a while You've

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(1) knocked that food base down You've not only reduced the
 (2) amount of food that's there you've reduced the relative
 (3) abundance of the different kinds of food so that the food
 (4) that's left may not even be the kind of food that the sockeye
 (5) can use So you've changed the zooplankton in the lake and
 (6) you've reduced the availability of it and it takes a while for
 (7) a lake system to come back
 (8) This particular kind of a lake system what they call a
 (9) glacial lake system a lot of glacial melt comes down into
 (10) these systems and are cloudy or milky looking so - and these
 (11) systems are cold and slow and it takes a while for these
 (12) things to come back So that stair step effect that you see
 (13) that stair step effect is a very serious phenomenon because
 (14) we're producing fewer and fewer smolt because conditions in
 (15) the
 (16) lake have deteriorated and the fish are not making it through
 (17) the winter
 (18) While the smolt production from 1989 spawning was poor the
 (19) production from the 1990 spawning was even worse even
 (20) though
 (21) the escapement wasn't out of the ordinary it was
 (22) extraordinarily large So now we're in a situation that we've
 (23) been trying to avoid by managing for our escapement goals
 (24) and
 (25) that is we have apparently damaged this lake system
 (26) Q And when you say damaged the lake system you're talking
 (27) about food among other things sir?
 (28) A Yes

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(1) Q Now were there similar problems with the ratio between
 (2) smolt production and the amount of fry that were available in
 (3) both 1992 and '93 as well?
 (4) A Yes The smolt production as measured by Alaska
 (5) Department
 (6) of Fish & Game continues to be low and also we're starting to
 (7) see more two year olds coming out I mentioned that sockeye
 (8) can go to sea when they are one or two or even three years
 (9) old Generally when things are normal in the Kenai they are
 (10) one year olds when they go to sea
 (11) We are seeing not only lower overall production but we're
 (12) seeing a lot more two year olds which means the other lake
 (13) systems other than Skilak which are warmer or different in any
 (14) event from the other lakes may be producing the majority of
 (15) the smolts and Skilak is producing very small which has
 (16) ordinarily been the biggest producing is producing less
 (17) Q Now based upon these discussions of smolt from the '89
 (18) fry from the '90 fry and even on to the '93 fry that
 (19) available smolt data is it your opinion that it is more likely
 (20) than not that the Kenai River system will not produce a
 (21) commercially harvestable surplus in 1994 and 1995?
 (22) A Yes it is
 (23) Q Now would the lack of commercially available surplus for
 (24) Kenai for that river system be important for management of
 (25) the entire Upper Cook Inlet area?
 (26) A Yes The harvest management system in Upper Cook Inlet is

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- (1) pretty much driven by the Kenai River system When the Kenai
 (2) is strong the harvests are good and when the Kenai is weak
 (3) the harvests are not so good Kenai is a dominant river system
 (4) in Upper Cook Inlet It's what the fleet depends on to make a
 (5) living most of the time
 (6) The other time it's the Susitna River which is in the
 (7) northern part of the district is not as strong a producer as
 (8) the Kenai usually but those fish are mixed They come in
 (9) about the same time and they are out in the fishing districts
 (10) about the same time So if they are worried about getting
 (11) enough spawners if they are worried about getting up to that
 (12) 400 000 lower level of the escapement then they may have to
 (13) constrain harvest on the Susitna They may have to cut back
 (14) I mentioned earlier it's possible to separate out the
 (15) Kasilof but that again is going to be a matter of making a
 (16) difference between the setnet gear and the drift gear which is
 (17) something Fish & Game doesn't like to do if it doesn't have
 (18) to So the Kenai will drive the harvest management system and
 (19) not having very many Kenai fish is going to cut back on what
 (20) they can catch out of the Susitna
 (21) Q Let's take a look at 775 If I understand you in an
 (22) effort to get an adequate return back into this river system
 (23) because the way the fish congregate and move out in Cook
 Inlet
 (24) you may have to cut back in other areas as well Is that
 (25) right?

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- (1) A That's right
 (2) Q Now let's go on and take a look at our next area which is
 (3) on Kodiak Island And does Kodiak Island have a red fishery as
 (4) well?
 (5) A Yes Kodiak Island has quite a few lakes that produce
 (6) sockeye
 (7) Q And is it your opinion - or let me ask first is the Red
 (8) Lake system one of those important sockeye management
 areas for
 (9) Kodiak?
 (10) A Yes The Red Lake system has produced catches of over a
 (11) million sockeye salmon for the fleet in Kodiak in the past
 (12) Q And is it your opinion sir that in the Red Lake system
 (13) sir on Kodiak there will be fewer to harvest because of the
 (14) spill?
 (15) A Yes that's correct
 (16) Q Can you explain to us why that is and if it's helpful to
 (17) refer to Exhibit 333 go ahead and do so
 (18) A Again you've got a graphic here in front of you that's
 (19) basically the same sort of format as the graphic we put up for
 (20) the Kenai River system This is an escapement goal on the left
 (21) and what actually occurred on the right and you can see that
 (22) the bar on the left is real short and the one on the right is
 (23) real tall
 (24) The Red Lake outlet Red River opens out into the sea It
 (25) doesn't come to a bay or anything kind of opens out to the sea

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- (1) on the southwest end of Kodiak and that entire harvest area
 (2) was oiled in 1989 and they didn't have a fishery down there at
 (3) all So they caught zero fish not like the case in Upper Cook
 (4) Inlet They didn't have a setnet fishery to figure out how to
 (5) deploy at that time so they just didn't fish they put
 (6) everything up the river
 (7) And again that was a concern So Fish & Game went out and
 (8) studied the lake and looked at the fry looked at what happen
 (9) to the amount of zooplankton in the lake found that the
 (10) species composition and the abundance of zooplankton was
 (11) reduced and the growth of the fry was reduced and these fish
 (12) generally come back as five years olds again the same
 (13) situation we saw in Upper Cook Inlet so the production from
 (14) the 1989 run is depressed
 (15) Q Is it your opinion that the harvest this year will then be
 (16) substantially below what otherwise would have been but for the
 (17) spill?
 (18) A Yes
 (19) Q And what is the current ADF&G prediction for 1994?
 (20) A For harvest?
 (21) Q Yes
 (22) A I think they are forecasting about 175 000 for the Ayakulik
 (23) district which is the district in which these fish are
 (24) harvested
 (25) Q And it's your opinion because of the Exxon Valdez oil

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- (1) spill that's why it is as low as it is this year?
 (2) A Yes that's right
 (3) Q Now let's go on sir to the next area that we're going to
 (4) talk about which is Prince William Sound and to re-orient
 (5) ourselves just a bit when we're talking about pink salmon
 (6) what is the duration of the life cycle?
 (7) A Well the pink salmon as we talked about earlier have a
 (8) real simple life cycle All the adults are two years old
 (9) They spawn in the fall put their eggs in the gravel in
 (10) Prince William Sound a lot of the spawning occurs very close to
 (11) the saltwater In fact some of these spawners are called
 (12) intertidal spawners And the young hatch out probably in the
 (13) late winter in February and start to button up along in March
 (14) and then after they button up - generally they are all out by
 (15) the end of May depending on the year
 (16) One more point Then they will stay in the near shore
 (17) areas feeding in the near shore areas until they get the
 (18) growth they need to get out and then they take off and spend
 (19) winter the following winter in the sea and come back that
 (20) following fall to spawn So it's a two year life cycle
 (21) Q Once they leave the gravel area the stream where are they
 (22) looking for food sir?
 (23) A Once they come out of the stream - as I indicated earlier
 (24) they don't eat much in the stream if at all and they depend
 (25) on the near shore environment to get their first meal

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- (1) Q What sorts of thing are they looking to eat?
- (2) A Well they eat tiny crustaceans which are generally called
- (3) zooplankton and these could be in the water column or they
- (4) could be in with the - actually down attached to the plants
- (5) that you find in the intertidal zone
- (6) Q Now is it your opinion that the Exxon Valdez oil spill had
- (7) effects on Prince William Sound pink salmon?
- (8) A Yes
- (9) Q Is that in part because of work you did with the justice
- (10) department and the NRDA group and later on with the Trustees?
- (11) A Yes Those are Trustee Council studies
- (12) Q What studies did the NRDA group do in this area?
- (13) A Well they did a broad range of studies in the fall of
- (14) 1989 we basically sat down and tried to imagine as best we
- (15) could what kinds of impacts the oil spill would have near term
- (16) and long term and then we looked at how much money we had
- (17) and went out and measured as many different things as we could
- (18) We were fortunate There were some field crews already out
- (19) in the spring of 89 going out to look at how many pink salmon
- (20) fry were in the gravel That's one way they forecast the
- (21) years They go out and see how many young salmon are in the
- (22) gravel and they use that to tell the fleet how many salmon to
- (23) expect the next year
- (24) Well these people were already on their way so on the
- (25) spot they designed some studies and then that fall we got

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- (1) together after the fishing season was over and picked out as
- (2) many different areas as we could - could afford to measure is
- (3) basically what it came down to what we felt was important and
- (4) what we could afford to measure
- (5) Q Was one of the areas that was studied by the Trustees in
- (6) the area of pink salmon embryo mortality?
- (7) A Yes
- (8) Q Let me call up 335 and if you wish to use this as an aid
- (9) you can do so to explain to the jury the results of the work
- (10) sir
- (11) A Again getting oriented on the graphic here up here on the
- (12) side you've got embryo mortality here all right so this would
- (13) be a ten percent loss 90 percent survived This would be a 20
- (14) percent loss 80 percent survived And these two lines here
- (15) the green shows a controlled and then up here on the top
- (16) these are the oiled streams
- (17) And we can see that - this is the 1989 case they also
- (18) measure this in 1990 and 1991 they found similar patterns
- (19) The mortality of the eggs in the oiled streams was on the
- (20) average a good deal higher and you can see how much here
- (21) than
- (22) the mortality of the salmon in the unoled streams This was
- (23) in the southwestern district in the path of the oil spill that
- (24) I measured
- (25) And also one thing that was interesting to me down here on
- (26) this axis we've got basically the distance from the stream

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- (1) mouth this would be the stream mouth right here and then you
- (2) move up the stream here and I was somewhat surprised to see
- (3) that we didn't get you know a major trend in this This
- (4) depression in embryo mortality was pretty much uniform in the
- (5) stream but generally statistics worked out really well and
- (6) there is a clear difference in the survival of the eggs in the
- (7) oiled and unoled streams
- (8) Q Were studies done as well to measure fry survival?
- (9) A Yes
- (10) Q What did they show?
- (11) A Well when we looked at the fry survival in the oiled and
- (12) unoled streams - now remember these are not the same fry as
- (13) were measured as these eggs (indicating) okay because they
- (14) take a sample of eggs it's pretty much sacrificed They
- (15) can't put it back in the gravel and let it grow up because
- (16) that also might bias the study because if you've got those
- (17) again in some other sample that would not be the best way to
- (18) do it
- (19) So we measured separate locations within oiled and unoled
- (20) streams slightly different locations so we wouldn't get the
- (21) same group of fish but nearby fish and we couldn't find a
- (22) statistical difference between the oiled and unoled streams
- (23) One reason for this negative result was just simply that you
- (24) have the cause of the mortality you have fewer animals to work
- (25) with There are more eggs than there are fry in a stream

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- (1) because some of them die in the interim and the statistics -
- (2) the more numbers you've got the easier it is to see
- (3) differences
- (4) So in my opinion the fact that we didn't see any
- (5) difference between the oiled and unoled streams doesn't prove
- (6) there weren't differences It just proves that we couldn't
- (7) measure differences
- (8) Q Were studies done by the Trustees to observe the condition
- (9) and distribution of these fry that you've just described in
- (10) Prince William Sound?
- (11) A Yes
- (12) Q What did they show sir?
- (13) A Well the studies that were done on - in the near shore
- (14) areas people went around and tried to collect juvenile salmon
- (15) from oiled and unoled areas and they split it into two
- (16) parts The federal government team took the wild fish and the
- (17) state people because they worked slowly with the hatchery
- (18) system took the hatchery fish And they looked at the growth
- (19) of the wild fish and the hatchery fish that they found in oiled
- (20) and unoled areas the idea being that if they found a fish in
- (21) an unoled area if they found it in a clear area that at
- (22) least it spent sometime outside the impact of the oil spill
- (23) And in both cases in the 1989 fish which had been born in
- (24) 19 - gone to gravel in 1988 and were trying to get out to sea
- (25) through these oiled areas in 1989 had depressed growth

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- (1) Now I mentioned to you earlier that when a young salmon a
 (2) salmon at that stage grows slow it's more likely to die So
 (3) they found reduced growth in the oiled areas relative to the
 (4) unoiled areas and their opinion was that that meant reduced
 (5) survival for those fish
 (6) Q And what is your opinion about this survival issue that
 (7) the - your opinion about what the study showed with respect to
 (8) survival?
 (9) A It showed that the salmon in the oiled areas that is
 (10) salmon that had spent time in oiled areas had reduced growth
 (11) and in my opinion that means that you get reduced production
 (12) And salmon at that age if they don't get to grow they die at
 (13) a fairly high rate And we know from laboratory studies that
 (14) fish exposed to products from oil from crude oil don't grow
 (15) as well as fish that aren't
 (16) So my opinion is that the survival of those fish was
 (17) reduced because of exposure to the oil
 (18) Q Sir is there any mixing of wild fish and hatchery fish in
 (19) the Prince William Sound pink fishery?
 (20) A Adults we're speaking about adults?
 (21) Q Yes
 (22) A Yes The adults of hatchery and wild fish come into the
 (23) Sound pretty much together and won't completely separate
 (24) until
 (25) after they commit to the spawning areas
 (26) Q Now with respect to the smolt were studies done to detect

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- (1) differences between smolt in adult survival between oiled and
 (2) unoiled streams as part of this analysis?
 (3) A Yes
 (4) Q And what did they show?
 (5) A Those studies were negative They tagged juvenile pink
 (6) salmon in the small streams that were oiled and unoiled and
 (7) put a little sliver of stainless steel in their head and
 (8) clipped off a small fin that they have on the back so they
 (9) could get the fish that had the sliver and they sampled the
 (10) fish to see how many of those got back So they knew how
 (11) many
 (12) they released and counted how many they got back and they
 (13) couldn't see a difference between this survival from the
 (14) juvenile to the adult between the oiled and the unoiled
 (15) streams
 (16) Now I mentioned earlier that in statistics when you have
 (17) large numbers you generally can see differences and when you
 (18) have small numbers it's hard to see differences and I think
 (19) what happened here is that these streams only produce a
 (20) certain
 (21) number of fish
 (22) Now in a hatchery we have millions and millions and
 (23) millions and we tag as many as we need to see a difference two
 (24) years from now because we have an idea how many are going
 (25) to
 (26) die so we know how many to tag in order to see them come
 (27) back
 (28) These small streams only produce a small number of smolts
 (29) and you can only catch a certain number of them to tag so the

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- (1) fact that they didn't see differences here again in my
 (2) estimation doesn't mean that there aren't differences It
 (3) means we didn't have enough fish to tag to measure them
 (4) properly
 (5) Q Were studies done by the Trustees to determine whether
 (6) there was damage to the salmon ecosystem?
 (7) A The Trustee Council measured a lot of different things in
 (8) the environment in the Sound that could give us some sense of
 (9) the health of the ecosystem
 (10) Q Was one of those the food sources and habitat for the
 (11) salmon?
 (12) A Yes that's correct
 (13) Q And what did the Trustees find?
 (14) A Well there were some pretty obvious effects that we really
 (15) didn't need teams of scientists to see because the habitat was
 (16) oiled and particularly in the intertidal near the mouths of
 (17) these streams so that salmon feeding in that area in addition
 (18) to you know having their growth reduced just by the effects
 (19) of the hydrocarbons themselves are ingesting also things that
 (20) had been exposed to hydrocarbons
 (21) Also the cleanup pretty well - well when you steam clean
 (22) the rocks they are clean they look nice but there is not
 (23) much on them to eat so the obvious gross effects were that the
 (24) near shore habitat the intertidal habitat was severely
 (25) disturbed and as a consequence the young salmon probably

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- (1) many cases had oiled food or didn't have enough food
 (2) In addition to this they also measured went around and
 (3) tried to get samples of fish and crabs to tell whether or not
 (4) they had been exposed at all to the oil and found - they
 (5) found that a number of the different kinds of fish had been -
 (6) shown evidence of being exposed to the oil I can't quantify
 (7) exactly what the problems were of that but they just wanted to
 (8) know the extent of the exposure And of course I believe
 (9) somebody else had the job of telling about the herring and
 (10) exposure of the herring and the consequences of that
 (11) So they did all of those kinds of studies that they could
 (12) afford to do
 (13) Q Now with respect - before we come back to herring with
 (14) respect to the other sorts of fish let me ask this first as a
 (15) predicate Do those other sorts of fish that the Trustees
 (16) study looked at do they live in the same environment and eat
 (17) the same sorts of things as the salmon do?
 (18) A Depending on their life history stage They would be in
 (19) the same areas as the salmon at various parts of their life
 (20) history Some of these are flatfish They were down at the
 (21) bottom That's why they surveyed them They wanted to see
 (22) oil was getting to the bottom part of the environment But
 (23) when those flatfish are young they are up right next to the
 (24) surface They are little thread like larvae and they are up in
 (25) the water column So at different parts of their life cycle

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- (1) they would be
 (2) Q Did studies include ones on dolly varden and cut throat
 (3) trout?
 (4) A Yes Those are fresh water trout that also go out to sea
 (5) for relatively short periods of time That is short compared
 (6) to what the salmon spend They go - stay in the intertidal
 (7) and subtidal areas in the vicinity of their streams sometimes
 (8) they range farther away and these dolly varden and cut throats
 (9) are feeding in the intertidal the same place that the juvenile
 (10) salmon are feeding
 (11) So the Trustees launched a study on the growth and survival
 (12) of the dolly varden and cut throat trout and they demonstrated
 (13) a reduction in growth and survival for these fish that are
 (14) closely associated with the intertidal area
 (15) Q Did they find - were there significant findings with
 (16) respect to those fish that shared the same intertidal growth
 (17) area as do the salmon?
 (18) A Yes Those results were statistically significant
 (19) Q When you say statistically significant I know - I have
 (20) an idea what you re talking about as a scientist but does that
 (21) mean that there was a negative effect from the
 (22) interrelationship with the oil spill?
 (23) A They found that by their standards of error by their
 (24) standards of proof that the growth and survival had been
 (25) reduced

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- (1) Q Now we did have Dr Kocan here yesterday to talk to us
 (2) about herring and I don t want you to repeat what he s told
 (3) us but is there some relationship in the life cycles of these
 (4) fish herring and salmon where they interrelate?
 (5) A Yes In managing fisheries generally we focus on a single
 (6) species would be the one that we spend most of our time
 (7) looking at but we have to be aware of the relations between
 (8) species particularly if we re going to harvest and we re going
 (9) to impact them ourselves The herring are sort of a universal
 (10) prey species in the environment so the fact that there are
 (11) fewer herring would be a concern to a salmon biologist because
 (12) a salmon biologist would worry about the juvenile salmon
 (13) themselves being eaten by predators that don t have any
 (14) herring
 (15) to eat
 (16) So when things change in the environment like the big
 (17) herring populations going for miles and miles of spawn down
 (18) to
 (19) a few hundred yards you d have to be concerned as a salmon
 (20) management biologist about the impact of that on the juvenile
 (21) salmon
 (22) Q Were there egg mortality studies done?
 (23) A Egg mortality studies on?
 (24) Q With respect to salmon
 (25) A With respect to pink salmon?
 (26) Q Yes
 (27) A Yes there were

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- (1) Q And what did they show?
 (2) A Well we ve previously discussed and with the graphic that
 (3) we had up here the egg mortality Embryo mortality studies on
 (4) the pink salmon showed that the eggs in the oiled stream had a
 (5) lower overall survival that is they had a higher embryo
 (6) mortality than did the eggs in the unoiled stream And that
 (7) difference again was statistically significant
 (8) Q And as you - I m going to ask you about some specific
 (9) opinions about Prince William Sound pink salmon Did you
 (10) bring
 (11) the various research that the Trustees did with respect to
 (12) dolly varden cut throat trout and herring and the embryos to
 (13) bear on the problem sir?
 (14) A Yes I considered all those factors in forming my opinion
 (15) yes
 (16) Q Now was there any attempt sir made by the Trustees to
 (17) determine how much more pink salmon would have returned to
 (18) Prince William Sound in 1990 but for the spill?
 (19) A Yes
 (20) Q What was the result of the Trustees study?
 (21) A The Trustees study looked at the - just part of the
 (22) problems created by the oil This is fish and shellfish study
 (23) number 28 and this was done by Hal Geiger with help from
 (24) quite
 (25) a few other people I participated in the initial stages of
 (26) the study
 (27) And Geiger using just the reduction in growth of the pink

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- (1) salmon that traveled through the oiled areas in 1989 from the
 (2) 1988 brood year estimated that the 1988 brood year produced
 (3) in
 (4) 1990 about - initially estimated about 2.7 million fewer
 (5) salmon adults in 1990 than would have been there but for the
 (6) effects of the oil
 (7) In other words the fish that were out there in 1989
 (8) suffered reduced growth This in turn caused increased
 (9) mortality so fewer of them came back as adults to spawn in
 (10) 1990 and the following year The estimate of 2.7 was
 (11) subsequently in later graphs reduced to about 2.2 million
 (12) because he was using catch data for the other side of the
 (13) equation that is he was taking the difference between what
 (14) should have been there and what actually showed up and the
 (15) catch is part of that
 (16) And fish ticket data is slow to come in sometimes so his
 (17) catch data is getting bigger and bigger on him So the final
 (18) figure of catch data have all been finalized and I think the
 (19) catch data was 2.2 million
 (20) Q Now we heard that 1990 was a record year Do you mean to
 (21) say it would have been an even larger year but for the spill?
 (22) A Yes
 (23) Q Did the Trustees estimate loss in 1991 and 1992 as well?
 (24) A Yes they did
 (25) Q What were the results in those years?
 (26) A Well in those years they also estimated losses but the

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- (1) basis for the estimates were different They weren't working
 (2) on the growth data anymore because the growth depression
 wasn't
 (3) measurable the following year That doesn't mean there wasn't
 (4) some kind of a depression of growth in 1990 just that it
 (5) wasn't what our methods allowed us to measure
 (6) So they worked just from the embryo mortality data They
 (7) went and looked at just the reduction in those streams that had
 (8) been oiled the numbers of fish that should have returned to
 (9) those oiled streams that didn't return because of death of the
 (10) eggs in the streams And so these numbers are quite a bit
 (11) smaller since they represent only a small portion of the impact
 (12) of the oil on those brood years
 (13) In my opinion I believe that the number that he estimated
 (14) was that there would have been 70,000 more adults coming
 back
 (15) to Prince William Sound as a result - but for the effects of
 (16) the oil spill because of the embryo mortality in 1991 and
 (17) about 40,000 fewer the following year 1992
 (18) Q Now these numbers in comparison to those that we've
 talked
 (19) about don't seem very big Do they nonetheless have any
 (20) significance for you as a salmon population biologist?
 (21) A Yes These numbers are small but in salmon management
 (22) salmon population biology we spend a lot of time go to a lot
 (23) of time and trouble trying to tell the difference between
 (24) different stocks of salmon We talked earlier about the Kenai
 (25) and the Kaslof different stocks Each stock has its own

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- (1) characteristics just like people Some of them are big
 (2) producers and some of them are not big producers and we
 have
 (3) to understand those differences between those stocks in order
 (4) to manage them because we don't want to fish stocks that are
 (5) not big producers hard We want to fish them easy and we can
 (6) fish the big producers hard
 (7) So those are the differences we try to respect when we're
 (8) writing fishing regulations and the fact that we had only -
 (9) that these numbers were only 70,000 and 40,000 these were
 wild
 (10) stock streams these were streams in the southwestern district
 (11) and these fish except for the amount that was harvested taken
 (12) out by the fleet would have been going to those streams to
 (13) spawn and contribute to the next generation
 (14) So even though you can look at all the fish that were gone
 (15) and the millions of fish that were coming back you can't use
 (16) those to justify reductions in a management sense to other
 (17) areas You can't say because we got millions of fish over
 (18) here that it's okay to overharvest or to diminish the fish in
 (19) this area
 (20) So as a salmon population biologist I believe the
 (21) reduction of those returns in terms of the population viability
 (22) could be significant and are certainly something I would take
 (23) into account in managing
 (24) Q All right Now for 1992 did the forecast models that
 (25) ADF&G set up work sir?

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- (1) A I'm sorry the year you said was?
 (2) Q 1992
 (3) A No they didn't
 (4) Q And is it your opinion that the Exxon Valdez oil spill in
 (5) 1989 was a significant contributing factor to the very low
 (6) population levels of both hatchery and natural pink salmon in
 (7) Prince William Sound in 1992 and 1993?
 (8) A Yes
 (9) Q And have you prepared a chart with your calculations on the
 (10) effect of the spill on pink salmon in Prince William Sound
 (11) after the spill?
 (12) A Yes
 (13) Q I'm going to show you a portion of what's been marked
 (14) Exhibit 318 and let's focus if we may sir on the first
 (15) line which I'll try and get the right portion on the machine
 (16) We want to save a little bit of the excitement here Thank
 (17) you
 (18) MR COOPER Always happy to see your excitement
 (19) BY MR JAMIN
 (20) Q In 1990 sir can you explain to us what that first line
 (21) reflects?
 (22) A Looks like -
 (23) Q You can't use - you're on the overhead Yeah
 (24) A This number here is a number that I discussed with you
 (25) earlier This is from the fish and shellfish study 28 This

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- (1) is the Geiger number produced for harvest - I mean adjusted
 (2) for harvest They have applied a harvest rate to the number
 (3) that he calculated lost - to figure out what portion of those
 (4) fish lost would have been taken by the harvest Same is true
 (5) in 1991 But the numbers in 1992 and 1993 are different
 (6) numbers
 (7) Q In what way sir?
 (8) A Well these numbers up here 91 represent partial impacts
 (9) of the oil spill They estimated what we were able to measure
 (10) in the time available with the resources available These
 (11) numbers down here (indicating) are deviations negative
 (12) deviations from the forecast Each year Fish & Game makes a
 (13) forecast of how much the fleet can expect to harvest so the
 (14) fleet can prepare for the abundance that it's going to
 (15) encounter out there And these harvest forecasts are based on
 (16) the number of fry that they have in the spring of the preceding
 (17) year
 (18) That's - as I told you some of the people were going out
 (19) to actually check on those fry at the time of the Exxon Valdez
 (20) oil spill That's why we had people out in the field at that
 (21) time
 (22) So they forecast the harvest that's going to be available
 (23) based on the abundance of fry in the preceding year and also
 (24) the weather data And forecasters who work with Fish & Game
 (25) they are not Fish & Game people That forecast is based on

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- (1) other things as well but this particular forecast that we see
 (2) for 1992 and 1993 the method is based on fry and weather
 (3) data
 (4) And this number is the difference between what Fish & Game
 (5) expected to come back in 1992 and 1993 as harvest that's the
 (6) harvest portion of it and what actually showed up And you
 (7) can see while the numbers for 90 and 91 are small numbers
 (8) these two numbers are really big numbers because the
 forecast
 (9) was totally high was extremely high in 1992 and 1993 They
 (10) expected a lot more fish to come back in 1992 and 1993 than
 (11) actually showed up
 (12) Q Now let's go back to the 1990 fish How would this group
 (13) have been affected by the oil?
 (14) A The 1990 estimate is based on reductions in growth from the
 (15) 88 brood year Now you just - on pink salmon you just
 (16) subtract two to get the brood year So in 1990 1988 would
 (17) have been the brood year so that was the young fish trying to
 (18) get out of the Sound at the time of the Exxon Valdez oil
 (19) spill They swam right into it
 (20) And so - and these were the reductions in growth that were
 (21) measured by the federal studies and the state studies on wild
 (22) fish and hatchery fish translated into survivals and projected
 (23) forward into adult harvest
 (24) Q And the 1991 fish sir?
 (25) A 1991 numbers is a small number because it's based only on

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- (1) the embryo mortalities the egg deaths in the oiled streams
 (2) just for the southwestern district Streams that were oiled
 (3) okay? So it's only a portion of a district and based only on
 (4) the egg mortality factor not on any other impact that the oil
 (5) may have had on the 1989 brood year
 (6) Q With respect to 1992 and 1993 were these sorts of
 (7) deviations between the expected harvests from ADF&G and the
 (8) actual returns seen in other areas of the state sir?
 (9) A No That's one of the reasons that these negative
 (10) deviations were so unexpected and are such a cause of serious
 (11) concern for me and for other salmon population biologists The
 (12) other big pink producing areas of the state such as
 (13) southeastern Alaska and Kodiak which grow up in the same
 areas
 (14) in the Gulf of Alaska and experience the same type of offshore
 (15) marine mortality are having record years They are producing
 (16) lots and lots of pink salmon and the survivals are very good
 (17) These forecasts were quite low and that was completely
 (18) unexpected
 (19) Q Sir do you have an opinion as to whether the sorts of
 (20) problems that we've seen in 1992 and 1993 with the pink
 salmon
 (21) in Prince William Sound can be expected to continue in 1994
 and
 (22) 1995?
 (23) A Yes I think the factors that we've seen particularly the
 (24) concerns about the problems with the ecosystem the problems
 (25) with the other species and the fact that these forecasts are so

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- (1) lower - I mean these runs are so low relative to the
 (2) forecasts these forecast errors are huge Until we see a
 (3) positive deviation or a run that comes in on the forecast I
 (4) don't see anything that leaves me of the opinion that these
 (5) factors are changed and if anything they may be
 (6) accelerating
 (7) Q All right sir And as part of your responsibilities and
 (8) part of the responsibilities of managers generally who work
 (9) with the Alaska Department of Fish & Game do you routinely
 (10) gather information about prevailing grounds prices and publish
 (11) those in ADF&G reports?
 (12) A Yes That's one of the pieces of information that we
 (13) collect as a service to the public
 (14) Q And did you review relevant reports in the preparation of
 (15) Exhibit 318 for the years 1990 91 92 and 93 to determine
 (16) what the grounds prices were in Prince William Sound for pink
 (17) salmon?
 (18) A Yes
 (19) Q And are these then those prices per pound?
 (20) MR COOPER Objection Your Honor
 (21) MR JAMIN I'll cover it up while we deal with the
 (22) objection
 (23) MR COOPER I don't believe Your Honor I heard the
 (24) witness was qualified with respect to pricing
 (25) THE COURT I don't think he's being asked for an

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- (1) opinion on prices He's being asked to produce factual
 (2) information
 (3) MR COOPER If that's all he does I don't have a
 (4) problem with that
 (5) MR JAMIN That's precisely it Your Honor
 (6) THE COURT I'll hear from you again if he deviates
 (7) from that
 (8) BY MR JAMIN
 (9) Q And were the numbers then in this column 32 cents 13 19
 (10) and 16 cents derived from the ADFG management reports?
 (11) A In the case of the 1993 numbers that's a management report
 (12) number In the case of 90 through 92 these are from the
 (13) fish ticket data that's collected from the Commercial Fisheries
 (14) Entry Commission So it's essentially the same kinds of data
 (15) because the management biologist works it up from the fish
 (16) ticket and sends it to the entry commission
 (17) The difference between the 90 and the 92 basis and the
 (18) 93 basis is that the Commercial Fisheries Entry Commission
 (19) generally has all the tickets available by the time they make
 (20) their estimates Sometimes the management program will only
 (21) have 99 or 98 percent
 (22) Q And just to clarify for Mr Cooper's benefit it's the
 (23) left hand side of the chart in which we've relied on your
 (24) expertise and the right hand side is just a calculation?
 (25) A That's right And another thing I'd like to point out is

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- (1) these numbers are guidelines as I say a service to the public
 (2) in case somebody is interested they want to get into the
 (3) business or they want to know what people pay for salmon but
 (4) those numbers don't include things like bonuses Sometimes
 (5) processors will pay bonuses They just sort of guideline
 (6) minimum sort of estimates of what was paid on the pounds for
 (7) fish
 (8) MR JAMIN Your Honor is this a good time to stop?
 (9) THE COURT We'll take our first recess We will be
 (10) in recess for 15 minutes
 (11) (Jury out at 10:00)
 (12) (Jury in at 10:15)
 (13) THE CLERK All rise
 (14) MR JAMIN Your Honor as Mr O'Neill says in the
 (15) interest of shortness of life I will conclude quickly
 (16) BY MR JAMIN
 (17) Q Let me just take a moment for clarification Can you again
 (18) indicate to us what the sources of the four numbers in the
 (19) average price per pound column are?
 (20) A Okay As I tried to indicate earlier the sources for the
 (21) top three numbers is different from the - that is the 32
 (22) cents the 13 cents the 19 cents excuse me is different from
 (23) the bottom number The top three numbers are based on
 averages
 (24) computed by the Commercial Fisheries Entry Commission The
 (25) bottom number the 16 cents is an ADF&G grounds price

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- (1) estimate which except for the addition of lost fish tickets
 (2) should be approximately correct
 (3) MR JAMIN Your Honor I would offer Plaintiffs
 (4) 318
 (5) (Exhibit 318 offered)
 (6) THE COURT Is there an objection?
 (7) MR COOPER No objection
 (8) THE COURT Plaintiffs 318 is admitted
 (9) (Exhibit 318 received)
 (10) BY MR JAMIN
 (11) Q Just one other area Dr Mundy We've talked about sort of
 (12) the long term difficulties with overescapement in the Kenai
 (13) River system Skilak Lake and the Kenai Lake and you
 mentioned
 (14) your opinion about the damage in the Kodiak - in Red Lake for
 (15) one year 1994
 (16) Did the overescapement phenomenon resulting from the zero
 (17) tolerance policy in Kodiak in 1989 have any ramifications for
 (18) the 1995 season in your opinion?
 (19) A Yes it could
 (20) Q What are they sir?
 (21) A Well when I indicated that the Red Lake fish on Kodiak
 (22) come back as five year olds generally when you say these fish
 (23) are five year olds or the fish from that population are six
 (24) year olds what you mean is that the majority of them come back
 (25) as five year olds or the majority of them come back as six year

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- (1) olds but they will come back as four five and six year olds
 (2) and sometimes rarely as seven year olds
 (3) So the primary impact of the overescapement in 1989 will be
 (4) felt on Red Lake in '94 but this could contribute to a lesser
 (5) run in at least one a smaller one that would have been there
 (6) the following year because the presence of six year olds from
 (7) the 1989 brood year and also probably contribute some
 (8) uncertainty to the management program because I know the
 (9) managers are concerned with the studies that show that the
 (10) rearing lake has been damaged to some extent
 (11) MR JAMIN Your Honor I have nothing further of the
 (12) witness
 (13) THE COURT Cross examine
 (14) CROSS EXAMINATION OF PHILLIP R MUNDY
 (15) BY MR COOPER
 (16) Q Good morning Dr Mundy How are you?
 (17) A Good morning Mr Cooper How are you?
 (18) Q I see you again
 (19) A Yes sir
 (20) Q Dr Mundy what I'd first like to do is talk a bit about
 (21) Prince William Sound Ms Stewart has a few documents some
 of
 (22) them you may need to or want to refer to
 (23) A Okay
 (24) Q Just don't knock them off of there because we won't be able
 (25) to put them back together again

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- (1) A That's a thought
 (2) Q I shouldn't have suggested that
 (3) THE COURT You better hope they don't fall off
 (4) THE WITNESS They won't Your Honor
 (5) BY MR COOPER
 (6) Q Dr Mundy you talked about the near shore environment in
 (7) the case of pink salmon in Prince William Sound Do you
 (8) remember that general subject matter?
 (9) A Yes
 (10) Q And we heard a lot about that when Dr Peterson was up here
 (11) the other day so let's talk a little bit about that If I
 (12) understood your concern correctly you were concerned about
 the
 (13) pink salmon coming out of the streams emerging out of the
 (14) streams after they button up?
 (15) A Yes
 (16) Q Incidentally what does button up mean?
 (17) A Button up means the hole that their yolk sac protruded
 (18) through closes up like a belly button
 (19) Q They don't button it up okay
 (20) When they come out of the streams they feed in the
 (21) near shore environment and you were concerned about what
 (22) effect the oil spill may have had especially in 1989?
 (23) A Yes
 (24) Q Let's put a little perspective on that If we can First
 (25) to the extent that streams weren't oiled or the areas in front

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- (1) of the streams in this near shore environment weren't oiled
 (2) then that concern wouldn't be one that would materialize would
 (3) it?
 (4) A Well that depends on what you mean by oiled Part of the
 (5) concern that I have here is our definition of what oiled and
 (6) unoiled is and the - kind of the crude level at which we can
 (7) measure things We're able to see the effects of only the very
 (8) worst If there is lower effects or subtle effects we don't
 (9) measure that
 (10) So I wouldn't say Mr Cooper that I'm unconcerned about
 (11) areas designated as unoiled
 (12) Q I guess we have to work with the tools that we have and
 (13) isn't it basically true though that if there was no oil in a
 (14) near shore environment then this concern about the young
 (15) pink salmon juveniles or fry feeding in that near shore environment
 (16) isn't really that much of a concern?
 (17) A Yes that's right if there were truly no oil it wouldn't
 (18) be a problem
 (19) Q Well we're going to hear a lot from other witnesses to the
 (20) extent of where there was oil and to what extent and the jury
 (21) has already seen some of that but if you back up a little bit
 (22) even before the fry get to the marine water before they flush
 (23) out of the stream into the marine waters - you talked about
 (24) embryo mortality for instance in the streams?
 (25) A Yes

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- (1) Q If there were no oil in the particular stream then that
 (2) doesn't become a concern does it?
 (3) A Again with the reservations I've expressed if there truly
 (4) were no oil in the stream and not just a matter if they didn't
 (5) measure any oil there would not be a problem
 (6) Q So we can agree on that if there is no oil measured in the
 (7) stream you don't think embryo mortality is going to be a
 (8) problem?
 (9) A No sir that's not what I said The fact that they didn't
 (10) measure any oil in the stream doesn't mean there wasn't a toxic
 (11) fraction in there or toxic fraction impacting it That's just
 (12) that they couldn't measure it
 (13) Q I guess we have to work with the tools we have and to the
 (14) extent you can measure it?
 (15) A Yes sir
 (16) Q Now let's see do you know how many streams were in fact
 (17) measured as having oil in the streams?
 (18) A I wouldn't want to give you an exact account without
 (19) checking records I generally have a concept of what
 (20) proportion of the production was estimated to have been oiled
 (21) Q Well tell you what let me ask you this question Does
 (22) some of the - some of the pink salmon when they come in to
 (23) spawn deposit their eggs above the intertidal zone?
 (24) A Yes they do
 (25) Q Would you expect to see oil above the intertidal zone?

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- (1) A Well I guess that depends on what you mean by oil I
 (2) guess some oil could be carried up there by animals or
 (3) something like that but the nature of the major impact above
 (4) the tidal zone would -
 (5) Q Pretty remote that an animal is going to cart a bunch of
 (6) oil up in the intertidal zone?
 (7) A Doesn't take much to kill a salmon egg
 (8) Q But you wouldn't expect to see much damage there?
 (9) A Well that's not my - based on the embryo mortality
 (10) studies that I've reviewed that's not my expectation
 (11) Q Did those embryo mortality studies show mortality above the
 (12) intertidal zone?
 (13) A Yes
 (14) Q These were done by Mr Bue basically under his
 (15) supervision?
 (16) A The studies themselves were done by a biologist named Sam
 (17) Sharr who did a good deal of the work on salmon in Prince
 (18) William Sound and the statistician was Brian Bue
 (19) Q I'll tell you what since you've seen this oil pretty much
 (20) all over how about an embryo that's raised in a hatchery?
 (21) A Yes
 (22) Q You wouldn't expect to see that oiled in 1989 would you?
 (23) A No
 (24) Q Do you know incidentally about what percentage of the fry
 (25) that are released that were released in 1989 were hatchery
 raised fry pink salmon?

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- (1) A The large majority of them Again I don't have - I don't
 (2) want to give you a percentage but the large majority were
 (3) Q I think we heard the number about 75 percent Does that
 (4) sound about right?
 (5) A Yes
 (6) Q Now this near shore ecosystem that you're concerned
 (7) especially in '89 we're talking about fish that were spawned
 (8) or born or whatever the right term is I guess in 1988 is
 (9) that one group?
 (10) A Yes
 (11) Q And that's because the fish that were depositing eggs in
 (12) 1988 those fish were kind of coming after the oil spill - in
 (13) that summer after the oil spill or the spring of the oil spill
 (14) were entering the Sound from the streams?
 (15) A Yes
 (16) Q And then they were in that near shore environment at that
 (17) point in time?
 (18) A Yes
 (19) Q And you also have some concern do you about the salmon
 (20) pink salmon that were deposited as eggs in 1989?
 (21) A Yes
 (22) Q Because in what the following spring they would have been
 (23) coming out in terms of this near shore environment that you
 (24) were concerned about into that environment?
 (25) A That's a concern The other concern is that the salmon

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- (1) eggs that were deposited in the oiled streams would have had a
 (2) higher mortality have a measurably higher mortality than the
 (3) salmon eggs that were deposited in unoiled streams
 (4) Q We'll come back to that but what I was interested in was
 (5) this near shore ecosystem concern that you were describing
 (6) A That would have been part of it yes
 (7) Q I thought when you were talking about near shore you were
 (8) talking about what Dr Peterson was talking about the other
 (9) day which is the marine waters right along the shore there?
 (10) A I'm sorry I didn't hear Dr Peterson's testimony
 (11) Q All right Well let's talk about that aspect of it When
 (12) I say near shore I'll be using that the way Dr Peterson was
 (13) that intertidal portion right where the margin of the Sound and
 (14) the land -
 (15) A I'm sure that Dr Peterson and I have the same definition
 (16) of the intertidal
 (17) Q Now the pink salmon that were born in 1988 one of these
 (18) two years that you're most concerned about they came back
 (19) when?
 (20) A They came back as adults plus two years from the time they
 (21) were deposited so that would have been 1990
 (22) Q So they returned in 1990?
 (23) A Yes
 (24) Q And the other year group there that you're especially
 (25) concerned with the 1989 group year the ones that were born in

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- (1) 89 they came back in what year?
 (2) A In 1991
 (3) Q Now let me show you a graph here we've got You may
 have
 (4) this in front of you up there but it's DX5759 That should be
 (5) the 1992 I think Prince William Sound area management
 report?
 (6) A DX5759 is that correct?
 (7) Q Yes You'll be relieved to know we're not going to read
 (8) the whole thing This is entitled Prince William Sound
 (9) Management Area 1992 Annual Finfish Management Report Is
 (10) that the one?
 (11) A Yes
 (12) Q I'm really only interested in one page on there at that
 (13) point in time and that's let's see page 105
 (14) A Do you want me to look it up in here?
 (15) Q You're welcome to use the monitor Unless you have some
 (16) reason to look at the rest of that we can just use the monitor
 (17) there
 (18) Now this shows the catch and escapement That means
 (19) basically the run size for the even year and the odd year pink
 (20) salmon in Prince William Sound?
 (21) A Yes that's right
 (22) Q And the first of these years that you were concerned about
 (23) with the pink salmon in the near shore environment those were
 (24) the fish that returned in 1990?
 (25) A That's correct

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- (1) Q So those are - they returned according to ADF&G in large
 (2) numbers didn't they?
 (3) A Well the fish that I'm concerned about didn't return at
 (4) all
 (5) Q You mean the fish that you think are missing?
 (6) A That's correct
 (7) Q Well let's talk about the ones that did show up Isn't it
 (8) a fact that that year class that 1988 year class that you were
 (9) concerned about being exposed to the oil came back in 1990
 (10) and basically set a record for the run size in Prince William
 (11) Sound?
 (12) A That's correct
 (13) Q And the fish that came back the next year in 1991 which
 (14) is this other year class that you were especially concerned
 (15) about in the near shore environment they came back and the
 (16) was what the second highest pink salmon run size that the
 (17) Sound had ever had wasn't it?
 (18) A Yes that's correct
 (19) Q Would you agree with me that certainly the hatchery fish
 (20) came back in big numbers in those years is that right?
 (21) A The hatchery fish did return at normal rates in those
 (22) years yes
 (23) Q Well the total numbers they came back in were record
 (24) numbers?
 (25) A They came back in good numbers yes

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- (1) Q And in both of those years the wild stock returned in
 (2) substantially larger numbers than their parents had returned
 (3) in correct?
 (4) A Yes
 (5) Q Now the fish as I understand - well you also talked
 (6) about what happened in 1992 and 1993 when the pink salmon
 runs
 (7) were disappointingly low?
 (8) A Yes
 (9) Q But those were not - those fish were not as exposed
 (10) certainly in the near shore environment as exposed -
 (11) potentially exposed to hydrocarbons than these fish that came
 (12) back in record numbers?
 (13) A I'd say that may be the case
 (14) Q Now incidentally if I heard you right you also expressed
 (15) concern about the herring as being impacted the interactions
 (16) between the herring and the salmon?
 (17) A Yes
 (18) Q Do you recall that general subject matter?
 (19) A Yes
 (20) Q Isn't it true also that the herring in the two years after
 (21) the spill 1990 and 1991 returned to the Sound to set records
 (22) record numbers of herring back to the Sound?
 (23) A Yes
 (24) Q Now if I looked at one of those charts correctly I think
 (25) you indicated that the - you were attributing the entire

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- (1) shortfall between the forecast run and the actual run in 1992
 (2) and 1993 to the oil spill?
 (3) A No
 (4) Q Is there some portion of that shortfall that you do not
 (5) attribute to the oil spill?
 (6) A I believe that the oil spill was a substantial factor
 (7) contributing to the large negative deviation in the runs from
 (8) the forecast of 92 and 93 That s a - not a quantitative
 (9) estimate that s a qualitative estimate I can t tell you what
 (10) the proportion or percentage of the oil spill had to do with
 (11) that
 (12) Q You ve made no attempt to quantify that?
 (13) A No
 (14) Q You haven t done any regression analyses or anything that
 (15) might shed some light?
 (16) A No I haven t personally done any but I ve looked at some
 (17) Q But you weren t offering any opinions on that during your
 (18) testimony on direct?
 (19) A I m sorry offer opinions on what?
 (20) Q I didn t hear you offer any opinions on that
 (21) A On what sir?
 (22) Q To the extent which the oil spill was a factor or how many
 (23) fish that didn t come back in 92 and 93 may have been
 (24) attributable to the oil spill
 (25) A Yes that s correct

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- (1) Q Now you did talk about some work by a biologist named
 (2) Geiger Is it Mr Geiger?
 (3) A Yes
 (4) Q And he is one of the Trustee principal investigators?
 (5) A Yes
 (6) Q His task was to try to synthesize the losses to pink salmon
 (7) in Prince William Sound attributable to the oil spill?
 (8) A His task was to synthesize the work on losses due to the
 (9) oil spill that were measured by the Trustee Council studies
 (10) Q And he came up in the years 1990 through - well what
 (11) years did his numbers refer to that he came up with?
 (12) A 90 91 and 92
 (13) Q And the total number of missing fish as it were because
 (14) of the oil spill were how many?
 (15) A Well again let me emphasize the fact that these were not
 (16) the total number of fish that were missing because of the oil
 (17) spill This was the total number of fish that was missing
 (18) because of the 1988 brood year and embryo mortalities only
 (19) respect to the oiled streams in the southwestern district
 (20) Q What he was trying to come up with was quantify the number
 (21) of pink salmon that were missing as it were because of the
 (22) oil spill on account of the factors - whatever factors the
 (23) Trustee Council scientists had come up with as ones they could
 (24) document?
 (25) A As ones they could afford to measure yes

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- (1) Q So what he was dealing with was to the extent that the
 (2) Trustee Council had come up with measurements that they felt
 (3) represented fish that were not there because of the oil spill
 (4) his task was to put the numbers on that?
 (5) A Yes And also remember the time frame during which he
 (6) worked as a state biologist he had a lot of different jobs so
 (7) he was only looking at three years worth of data to come up
 (8) with these estimates and hasn t considered in his estimates
 (9) anything that we ve learned since that three year time period
 (10) Q Well you re not suggesting that he didn t do a thorough
 (11) job with the data that he was working with?
 (12) A With the three years of data that he was working with and
 (13) with respect to the causes of mortality that he identified he
 (14) did a very thorough job
 (15) Q Who is Dr Spies?
 (16) A Bob Spies is the chief scientist for the Trustee Council
 (17) Q So he s kind of the head scientist for the whole group?
 (18) A Yes
 (19) Q And that s about how many scientists?
 (20) A I don t really know
 (21) Q He s somebody - do you deal with Dr Spies?
 (22) A Yes
 (23) Q He s a good scientist?
 (24) A Yes
 (25) Q Presuming he had to do something right in order to achieve

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- (1) that position?
 (2) A He s a good scientist
 (3) Q You were at the recent symposium if I ve got the right
 (4) word I think it was a fifth anniversary of the Trustee Council
 (5) symposium or presentation up here in Anchorage?
 (6) A Fifth anniversary of the spill
 (7) Q So it was in March?
 (8) A I think the date s on the jacket of this cover here I
 (9) think it was sometime in March I don t really recall I go
 (10) to a lot of scientific meetings
 (11) Q Well I ll represent to you the spill was in March That s
 (12) probably something you and I can agree on
 (13) A But this was a government operation It doesn t mean that
 (14) they actually held the meeting in March
 (15) Q Maybe we can t agree on that either
 (16) Exhibit 8739 - Irene I gave you the wrong number here
 (17) It should be 5983 You may have that up there Dr Mundy
 (18) 5983
 (19) Dr Spies keeps pretty well abreast does he not on what
 (20) the Trustee scientists are doing?
 (21) A Yes sir that s his job
 (22) I m sorry what was that number again?
 (23) Q 5983 If you don t have it in there let me know and we ll
 (24) find you a copy
 (25) A I ve got it

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- (1) Q Let me get a highlighter here
 (2) You've seen this brochure before haven't you?
 (3) A Yes
 (4) Q This is a brochure that was put out in connection with this
 (5) fifth anniversary proceeding?
 (6) A Yes I received a copy of this brochure at the meeting
 (7) Q I can show you page 14
 (8) See if we can't do better than that
 (9) Now this is a piece by Dr Spies is it?
 (10) A I have been told that Dr Spies wrote this however I am
 (11) not - I'm not an authority on that I certainly didn't
 (12) discuss this with him or look at it so I don't really know
 (13) whether he wrote this or not
 (14) Q I guess maybe in the interest of seeing if - if this isn't
 (15) something that you and I might agree upon it says on page 7
 (16) summary of entries by Doctor Robert Spies chief scientist
 (17) A Yes sir that's the representation
 (18) Q Now Dr Spies says on page 14 here if I can get back to
 (19) it That egg mortality might translate into a decline of as
 (20) much as ten percent in the entire adult pink salmon run in
 (21) Prince William Sound if all the other factors which contribute
 (22) to salmon mortality are added together with the oiled stream
 (23) effects
 (24) A Yes
 (25) Q Now you haven't told Dr Spies at any time that you

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- (1) disagreed with that statement have you?
 (2) A No nor have I told him that I agreed with it
 (3) MR COOPER Your Honor I would offer into evidence
 (4) that Exhibit 595
 (5) (Exhibit 595 offered)
 (6) MR JAMIN Just the page relating to pink salmon? No
 (7) objection
 (8) THE COURT It's not clear to me whether it's just the
 (9) page or the whole thing
 (10) MR COOPER Your Honor we can do the whole thing as
 (11) far as we're concerned
 (12) MR JAMIN We'll do it then
 (13) MR COOPER Well let me take a look
 (14) MR JAMIN I think he's put his feet in concrete
 (15) Your Honor let's keep it there
 (16) MR COOPER I think there is material in there that
 (17) doesn't relate to the issues in here so let me take a look at
 (18) it
 (19) THE COURT You all get together and see if you can
 (20) work it out
 (21) BY MR COOPER
 (22) Q Now Dr Mundy let's go to the embryo mortality studies
 (23) that you were talking about earlier
 (24) I think you described that what the Trustee report showed
 (25) was that there was a difference in mortality rates of these

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- (1) pink salmon eggs in the - in the streams when measured in the
 (2) fall of the year?
 (3) A Yes
 (4) Q This was in what years?
 (5) A 1989 1990 and 1991
 (6) Q And this is where they - some of the scientists or
 (7) biologists went to oiled and unoled streams and they pumped
 (8) in the fall they pumped - this was what a month or two or
 (9) more or less after the spawning event more or less?
 (10) A Yes more or less
 (11) Q And they basically pumped out of the gravel eggs and they
 (12) counted which ones were dead and which ones were alive and
 (13) they
 (13) came up with a mortality rate?
 (14) A That's right
 (15) Q And the study as you understood it indicated that the
 (16) mortality rate in the oiled streams was somewhat higher than
 (17) the mortality rate than in the unoled streams?
 (18) A Mortality rate in the oiled streams was higher
 (19) Q Then those biologists went back in the spring of the next
 (20) year didn't they?
 (21) A Yes
 (22) Q And they at this time what pumped out mostly fry I
 (23) suppose alevins?
 (24) A By that time they are fry
 (25) Q And then they compared those fry that they pumped out with

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- (1) the total number of eggs and the same density of eggs that the
 (2) had seen in the fall correct?
 (3) A Well yes but those are not the same eggs because the egg
 (4) that they surveyed in the fall are gone those were sacrificed
 (5) so these are not the same nests but this is a comparison
 (6) Q But they used the same number per square meter of eggs so
 (7) they could have the same density of eggs?
 (8) A That's right
 (9) Q And then they calculated how many or what percentage of
 (10) those eggs that were there in the fall produced live fry?
 (11) A I don't know if that's the way I would put it It's hard
 (12) for me to join that statement
 (13) Q Well I can show you the report if that will help
 (14) A If you're reading from the report can I see the report?
 (15) Q Well I wasn't reading right from it but let's see if we
 (16) can - let's see that will be Exhibit 1994 You don't have
 (17) one up there
 (18) A 1994? I'm sorry
 (19) Q Let me if I may give you this one
 (20) Let's see I think at page - let me see if I could find a
 (21) cite for you there I think actually the way they did it was
 (22) explained in appendix B 3 on page ten of that appendix Or
 (23) page 32 may be the better one
 (24) A I'm sorry I found the B 3 Do you want me on page 32?
 (25) Q Well if that has the information on it that you were

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- (1) looking for Which ever page has the information you were
 (2) looking for
 (3) A I wasn't looking for any information I just wanted to
 (4) know what you were referring So what are you referring to?
 (5) Q What I'm referring to is the calculation or the way they
 (6) calculated the spring mortality rate or the survival rate
 (7) A And how are you characterizing that?
 (8) Q Well as I understand it correct me if I'm wrong
 (9) basically what they were looking at was the number of live fry
 (10) that they pumped out in the spring compared to the total
 number
 (11) of eggs that they had found in the fall?
 (12) A Again the reason I'm hesitating here Mr Cooper is that
 (13) this is a mathematical representation and while that may be a
 (14) fair verbal characterization of it it's a - I'll go with
 (15) that but that's not exactly the mathematical characterization
 (16) Q Well isn't it correct though that basically the spring
 (17) egg mortality number took into account the mortality of the
 (18) eggs in the fall?
 (19) A It took into account an estimate of the mortality of the
 (20) eggs in the fall
 (21) Q An estimate I guess nobody can know for sure?
 (22) A I just want to make sure we're not comparing the eggs in
 (23) the nest to the number of fry that were in that nest in the
 (24) spring because that's not what's being compared here
 (25) Q Well is what's being compared the number - well do you

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- (1) know what's being compared here?
 (2) A Yeah An estimate of the density of the eggs and the
 (3) density of the fry in roughly the same locality in the spring
 (4) Q If they - didn't they in fact find that by the time that
 (5) you look at these numbers in the spring to see - of the eggs
 (6) that were basically there deposited there using these
 (7) estimates that by the time you look at it in the spring there
 (8) is no difference between the survival or mortality whichever
 (9) way you want to look at it of these spring salmon?
 (10) A They found that there was no measurable difference that's
 (11) correct
 (12) Q Now I believe you indicated if I heard you correctly on
 (13) direct that you quarreled with the statistical power that they
 (14) used with that finding?
 (15) A I don't have any quarrel with it
 (16) Q Now I think another study that you referred to was one
 (17) that dealt with growth rates or length or weight of juveniles
 (18) Do you recall that general subject matter?
 (19) A Yes
 (20) Q Would that have been the Willette or the Wertheimer study?
 (21) A Would have been both
 (22) Q Now the Willette study that found this difference in
 (23) growth rates was looking at fish from which - what year class
 (24) or brood years of fish were they looking at?
 (25) A Willette looked at I believe - I know he looked at 1989

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- (1) and 1990 I'm not sure if he looked at other years
 (2) Q Well he found a difference in growth rates between the
 (3) fish that he trawled up or however he collected them from
 (4) oiled versus unoiled areas for the year 1989?
 (5) A Yes
 (6) Q But not for 1990 and 1991?
 (7) A That's correct He didn't measure any differences He
 (8) looked at 89 90 and 91 He found differences between oiled
 (9) and unoiled areas With respect to the effects observed 1989
 (10) he was not able to measure those same differences in unoiled
 (11) areas for 90 and 91
 (12) Q Now those fish that he measured the differences in 89
 (13) the only year that he found a difference those fish were the
 (14) ones that came back in 1990?
 (15) A Yes
 (16) Q Because they were near shore fry or fry in 89?
 (17) A Those were the juveniles that were swimming out throughout
 (18) the oil affected areas during the time of the Exxon Valdez oil
 (19) spill They were the ones trying to make it out through the
 (20) oil spill
 (21) Q And again those were the fish that returned in record
 (22) numbers in the year 1990?
 (23) A As I previously indicated some of them didn't and some of
 (24) them did
 (25) Q Well some of them didn't return in record numbers what

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- (1) you mean is there might have been more?
 (2) A But for the effects of the oil spill there would have been
 (3) more
 (4) Q But in any event we do know the ones they found a growth
 (5) difference in and that brood year of fish came back in record
 (6) numbers That we can agree upon I assume?
 (7) A He worked with fish from specific - a specific hatchery or
 (8) from specific hatcheries Without looking at the return rates
 (9) I would say that you're probably generally correct but without
 (10) looking at those exact return rates I can't give you a flat
 (11) yes on that
 (12) Q Now the Wertheimer study was another one that looked at
 (13) growth?
 (14) A Yes
 (15) Q And he looked in what year?
 (16) A He looked in the year of the spill
 (17) Q And the fish that he looked at again were the ones that
 (18) came back in record numbers in 1990?
 (19) A They were part of the 1990 - they returned as adults in
 (20) 1990 yes
 (21) Q And he went out and looked in 1990 this would have been in
 (22) the 1989 brood year class and he couldn't find any difference
 (23) could he?
 (24) A He couldn't measure any difference
 (25) Q If he couldn't measure one he couldn't find one?

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- (1) A He couldn't measure any difference
 (2) Q He used the best tools he had and he couldn't find a
 (3) difference?
 (4) A He couldn't measure a difference
 (5) Q Did he also look at chum salmon?
 (6) A He may have. At the moment I just don't recall
 (7) Q Now you think that the impact of oil on pinks was similar
 (8) to the impact of the oil on the chum salmon, don't you?
 (9) A Yes. It may have been because the two share certain parts
 (10) of the life cycle of pink salmon. Chum are quite similar in
 (11) that the chum salmon don't spend much time in fresh water
 after
 (12) they button up. After they absorb their yolk sac, they tend to
 (13) drop right down to the marine environment. But unlike the pink
 (14) salmon, chum salmon don't come back in two years. They are
 (15) more like sockeye salmon in that they can be four or five or
 (16) six years old when they come back.
 (17) So there are some similarities in the life cycle that would
 (18) lead me to suspect that some of the impacts of the oil spill
 (19) may have been the same on the chum salmon as on the pink.
 (20) Q And do you recall that Mr. Wertheimer found in his study
 (21) that in fact in 1989, when he looked at the size of these fish
 (22) including chums, he found that the chums actually had a higher
 (23) apparent growth than did the - the chums from the oiled areas
 (24) had a higher apparent growth than the chums from the unoiled
 (25) areas?

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- (1) A Yes. That would be consistent with normal statistical
 (2) sampling error. That indicates to me he was having some
 (3) problems with his measurement techniques and that he was
 (4) getting numbers that were bouncing around a bit on him.
 (5) Q Dr. Mundy, it seems whenever there is a finding of any kind
 (6) in here that suggests that maybe there wasn't the oiling impact
 (7) that you think there might have been, you say maybe because
 he
 (8) wasn't able to measure it accurately.
 (9) Is that the case with everything in here that you think
 (10) reflects lack of an impact that you believe it just didn't
 (11) have - there wasn't enough power or statistical power to
 (12) measure it?
 (13) A No. And in fact I am truly glad that you asked that
 (14) question because I do need to clarify a point.
 (15) Q Why don't you go ahead and clarify it?
 (16) A In science, if you find an effect, okay, then that may
 (17) prove a point. That may prove that your opinion is appropriate
 (18) and correct and you've got support for your opinion, however
 (19) when you go out and you have an effect and - I mean the
 (20) Exxon Valdez oil spill was a very large and serious shock to
 (21) the environment and when you have an effect like this that
 (22) leads you to conclude that you might see some problems out in
 (23) the ecosystem, then it's reasonable to expect that you're going
 (24) to see some effects.
 (25) However, when you go out and you find no effect, that is

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- (1) you can't measure something that doesn't prove the negative
 (2) okay? If you don't find it, that doesn't mean that it's not
 (3) there. That just means that you couldn't find it, you couldn't
 (4) measure it.
 (5) So I think that oftentimes in science we - when chemistry
 (6) and physics find no effect, we don't need to jump to the
 (7) conclusion that there is no effect. We should just simply say
 (8) we didn't find anything to report on, and that's that.
 (9) Generally, scientists are really disappointed when they
 (10) find no effect because there isn't anything to write a paper
 (11) on. Sometimes they do anyway just because they spend so
 much
 (12) money.
 (13) Q Does that mean that every time in all these Trustee studies
 (14) that they purport to find no effect, you don't believe that
 (15) there wasn't any effect?
 (16) A That's not what I'm saying.
 (17) Q Well, you're saying that you don't know whether there was
 (18) any effect or not?
 (19) A That's correct.
 (20) Q Certainly there is no proof - where they say they can't
 (21) find an effect, there is no proof that there was an effect, no
 (22) scientific proof?
 (23) A Now we're communicating.
 (24) Q Going back to the Wertheimer study for a moment, there is
 (25) something called a condition factor, isn't there?

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- (1) A Yes.
 (2) Q Now, Wertheimer, did he look at weight or length in
 (3) addition to condition factor, which I'll come to in a moment?
 (4) A Well, a condition factor is made by looking at -
 (5) Q Can you just answer that, did he look at length?
 (6) A If he looked at the condition, he must have looked at them
 (7) because it's a function of length and weight.
 (8) Q Let me see if I can try a hand at explaining what condition
 (9) factor is, see if you'll agree. If I grab Mr. Sanders here
 (10) for instance, if he stands up for a minute, I'm a lot taller
 (11) than he is, if you measured our length, I would have more
 (12) length?
 (13) A I think you can get a yes on that.
 (14) Q I'm not going to ask you what happens - well -
 (15) Now just assume for a minute, against all the evidence
 (16) that he is a world class marathoner. The fact that he is -
 (17) MR. JAMIN: We'll stipulate to that. Your Honor.
 (18) BY MR. COOPER:
 (19) Q The fact that he's shorter than I am doesn't mean he's less
 (20) healthy than I am, is that correct?
 (21) A That's correct.
 (22) Q And in fact you could reverse the situation, I suppose, and
 (23) if you had somebody that was longer, or a fish that was longer
 (24) than another fish, it might be more healthy than a fish that
 (25) weighed more?

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- (1) A That could be the case yes
- (2) Q So scientists have come up with a way of combining those
- (3) two things length and weight in what they call a condition
- (4) factor sort of an index of the health of the fish?
- (5) A Yes
- (6) Q And Mr Wertheimer looked at the condition factor which is
- (7) the relationship between length and weight did he?
- (8) A Yes
- (9) Q And isn't it true that he found that the condition factor
- (10) for pink salmon from the oiled locations was actually higher
- (11) than the condition factor for the pink salmon from the unoiled
- (12) locations?
- (13) A Again he may have found that Are you reading from a
- (14) report?
- (15) Q Well I can show you the report if you want
- (16) A If you're reading from a report and I can confirm that
- (17) report - I don't at the moment recall That may have been the
- (18) case
- (19) Q Why don't you look at Exhibit 1934 if you have it up
- (20) there
- (21) A Okay I have the document
- (22) Q I've got a reference to a page 2 13 - or section 2 13 It
- (23) may be Are you able to find that section?
- (24) A I'm sorry I can't find 2 13
- (25) Q Well that particular - let me try one other thing If

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- (1) you look at the bottom of page 2 -
- (2) A I have -
- (3) Q This may be what I'm looking for although I'm certainly
- (4) not going to guarantee it It says analyses of length weight
- (5) 1990 and 1991 - I'm sorry analysis of length weight
- (6) regression slopes as a measure of condition were inconclusive
- (7) A Yes I see that
- (8) Q So does that indicate they couldn't find any difference in
- (9) the condition factor from the fish in the unoiled and oiled
- (10) conditions?
- (11) A Yes Now I have a chance to look he - they didn't
- (12) measure differences in condition factors
- (13) Q Now let me turn to the subject matter that you addressed
- (14) was disappointingly low 1992 and 1993 run sizes pink salmon
- (15) run sizes in Prince William Sound
- (16) A Yes
- (17) Q Those run sizes were comprised - let's take the 1992 run
- (18) first Those were comprised of fish that were spawned in 1990?
- (19) A Yes
- (20) Q The year after the oil spill?
- (21) A Yes
- (22) Q And the run - the 1993 run size which was comprised of
- (23) the fish that were - well that was comprised of fish that
- (24) were deposited as eggs in - or embryos in 1991 correct?
- (25) A Yes

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- (1) Q Let's start with the first one of those the 1990 brood
- (2) year fish that returned in low numbers in '92
- (3) When did they enter the waters of the Sound leave the
- (4) streams and enter the waters of the Sound?
- (5) A They would have been in the waters of the Sound probably in
- (6) late winter and early spring of 1991
- (7) Q So they were - they didn't enter the Sound until really
- (8) two years after the oil spill?
- (9) A That's correct almost exactly two years
- (10) Q And the fish that comprised the poor run in 1993 when did
- (11) they enter the waters of the Sound?
- (12) A The previous year the spring of the previous year
- (13) Q So the spring of 1992?
- (14) A That's correct
- (15) Q So they didn't even come into the Sound until three years
- (16) after the oil spill?
- (17) A That's right
- (18) Q Now let's see you haven't measured have you the
- (19) concentrations of any oil that may have been in the Sound if
- (20) there was even any in 1992 when those fish that failed to come
- (21) back in '93 entered the Prince William Sound have you?
- (22) A Have I measured any?
- (23) Q Yes
- (24) A No I haven't
- (25) Q Or the 1991 levels?

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- (1) A No
- (2) Q You concluded if I recall correctly in the damage chart
- (3) that we looked at the entire shortfall between the projection
- (4) for the pink salmon returns in 1993 - or let's say '92 and
- (5) what actually showed up?
- (6) A That's right
- (7) Q So if I understood your calculation correctly you are
- (8) attributing the entire shortfall to the oil spill?
- (9) A No you do not understand me correctly
- (10) Q Well is there some portion of the difference between
- (11) the - some portion of the difference between the forecast and
- (12) what actually showed up that you believe the oil spill was not
- (13) a substantial factor in producing?
- (14) A Mr Cooper as I previously responded -
- (15) Q Can you answer that question?
- (16) A Can I answer which question?
- (17) Q The one I just asked
- (18) A Could you restate it please?
- (19) MR COOPER Could we have the reporter read it back
- (20) (Record read)
- (21) THE WITNESS Okay I understand I can't give you a
- (22) quantitative estimate on what proportion of that number is due
- (23) to the effect of the Exxon oil spill no
- (24) BY MR COOPER
- (25) Q And the same with respect to 1993 you can't give a

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- (1) quantitative estimate on that?
 (2) A No
 (3) Q In fact there is underway currently isn't there
 (4) something called the SEA the Sound what is it Ecology
 (5) Assessment?
 (6) A Sound - SEA I believe is Sound Ecosystem Assessment
 (7) Q And one of the purposes of that is to try to figure out why
 (8) the pink salmon among other things have been producing
 (9) disappointing runs in the recent years?
 (10) A I believe that the apparent collapse of the Prince William
 (11) Sound ecosystem in 1992 was a motivating factor for that study
 (12) Q And that effort is just getting underway basically?
 (13) A Yes
 (14) Q Now you believe don't you - and you've been
 (15) participating in that effort?
 (16) A I have participated in that effort in the design phase and
 (17) as a peer reviewer I haven't been involved in it as a -
 (18) collecting any data
 (19) Q And you described for me in one of the depositions - if
 (20) you recall I asked you what you believe may be happening in
 (21) the Sound that might be accounting for these low runs and you
 (22) described some various factors I think you referred to for
 (23) instance some oceanographers Doctor Royer and Doctor
 Cooney
 (24) Do you remember that subject matter?
 (25) A Yes

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- (1) Q And your belief as to factors that may be at work here
 (2) include a belief that for some reason perhaps because of
 (3) temperatures if I understood it correctly or temperature
 (4) changes the portion of the Sound or the Sound surface waters
 (5) may be moving differently than it has in the past?
 (6) A No that's not my opinion I believe I do know what you're
 (7) referring to Would you like me to -
 (8) Q Why don't you tell me - you can say it better than I do
 (9) what you told me in the deposition
 (10) A The concept that you're referring to - Doctor Royer and
 (11) Doctor Cooney are oceanographers from the University of
 Alaska
 (12) Fairbanks who work on ecosystem problems in Prince William
 (13) Sound And they have a concept that when certain kinds of
 (14) weather events occur and push the surface waters of Prince
 (15) William Sound offshore that is out of the Sound that that
 (16) takes food away from fish including the juvenile pink salmon
 (17) so their survival would go down
 (18) And when you don't have these weather events the food
 (19) tends to stay in the Sound it doesn't get pushed out and it's
 (20) better for the young fish
 (21) I'll note Doctor Cooney and Doctor Royer don't appreciate
 (22) it but I call this the toilet bowl theory of Prince William
 (23) Sound because basically when the Sound gets flushed the
 food
 (24) goes out and there is nothing for the fish to eat They
 (25) believe that's caused by wind forcing on the surface waters

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- (1) And that when that doesn't happen things are better for fish
 (2) Is that the concept?
 (3) Q I think that's what you explained in your deposition And
 (4) you think that's one of the things that may be happening in the
 (5) Sound?
 (6) A I believe that they have a reasonable basis for their
 (7) opinions
 (8) Q Now you also believe that maybe the next most likely
 (9) alternative source of the high levels of marine mortality among
 (10) the pink salmon may be predation?
 (11) A The next most likely in comparison to the flushing
 (12) hypothesis?
 (13) Q Yes I believe so
 (14) A I don't know how to order those in terms of likelihood I
 (15) believe that the flushing hypothesis has a reasonable basis and
 (16) I believe that predation including - the term that they use
 (17) is prey shifting that is predators shifting from one prey
 (18) species to another in response to the loss I believe that's
 (19) also a likely explanation
 (20) Q And you think that either one or both of those maybe
 (21) important factors in what's happening in the Sound?
 (22) A Oh yes
 (23) Q Isn't it true that also that there is concern or at
 (24) least - there is concern among biologists and the scientific
 (25) community that the use of artificial propagation such as the

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- (1) hatcheries hatchery salmon production may produce some
 (2) ecological results in an area like the Sound where there is a
 (3) lot of salmon production artificial salmon production?
 (4) A That's an opinion that I've heard I don't believe that
 (5) it's scientifically well founded in the case of Prince William
 (6) Sound The reason that I don't think it's particularly
 (7) well founded is that you have a fairly good track record with
 (8) the hatcheries of producing - you showed a graph yourself he
 (9) and pointed out that the salmon produced at very high levels
 (10) the hatchery have in the past had very high survival levels
 (11) So the fact of competition between hatchery fish and wild fish
 (12) in the past has not diminished the survival either as far as we
 (13) could see
 (14) Now we have a very very knife-edge sharp collapse in the
 (15) productivity of the ecosystem following a similarly sharp shock
 (16) or impact to the ecosystem in 1989 I think it's worth looking
 (17) at but I wouldn't include that at the top of my list as
 (18) problems in the Sound
 (19) Q But the production of the hatcheries - well the
 (20) hatcheries started up when in the late 70s?
 (21) A Well the planning for those -
 (22) Q In the Sound
 (23) A Excuse me?
 (24) Q When they came on stream on line in the Sound
 (25) A Basically they had it locked down and figured out by 1984

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- (1) You re correct planning of the construction phase dated from
 (2) the 1970s
 (3) Q And then they got what kind - what kind of numbers are
 (4) they producing now?
 (5) A You mean adults or fry?
 (6) Q Fry
 (7) A I don t They are producing -
 (8) Q Several hundred million?
 (9) A - millions and millions they are producing a lot of fry
 (10) We already talked about the fact that usually the majority of
 (11) the fry coming out of the Sound are from hatcheries
 (12) Q Let me turn now to a different subject that you addressed
 (13) which is sockeye in Upper Cook Inlet Do you remember that
 (14) subject matter I m sure?
 (15) A Yes
 (16) Q And you - if I understand you correctly your concern is
 (17) that the sockeye - there won t be returns of sockeye in Upper
 (18) Cook Inlet in the Kenai system starting when this year?
 (19) A I didn t say that there wouldn t be returns What I said
 (20) was that I didn t believe that there would be a harvestable
 (21) surplus returning to the Kenai River based on smolt production
 (22) you know from the affected brood years
 (23) Q And the affected brood years are not expected to return
 (24) until later this year?
 (25) A Later this year 1994 1995 So far this year I haven t

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- (1) seen the numbers to know whether or not the brood year is
 going
 (2) to produce or whether the 1998 production has been affected or
 (3) not
 (4) Q I guess what I m driving at this is not a run failure
 (5) that s materialized this is one that you expected is going to
 (6) materialize?
 (7) A Upper Cook Inlet adults are going to be coming back from
 (8) right now peaking about the 17 of July in the fishing
 (9) districts and about the 21 or 22 up in the rivers where the
 (10) escapements count
 (11) Q We may not know I guess whether in fact there are not
 (12) going - the run is very low or there won t be any harvestable
 (13) surpluses until we finish this phase of the trial?
 (14) A Well at this point in time since survivals can t exceed a
 (15) hundred percent that is we can t make adults where there
 (16) aren t any smolts we have to have some production to start
 (17) with It s clear to me that the harvest based on the Kenai
 (18) from the 1989 brood year is diminished Even if the smolt
 (19) estimates were low lower than what actually came out the
 (20) numbers that were produced were quite low They were very
 (21) very low as we ve already seen here
 (22) So I don t want to wait until I see the adults to know
 (23) there has been a loss It would be easy to quantify a loss
 (24) after you saw the adult returns
 (25) Q Well I think you ve said in there what I was basically

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- (1) driving at that the information upon which you base your
 (2) belief that there is not going to be a harvestable surplus this
 (3) year are the counts of the smolt that left the system in
 (4) earlier years?
 (5) A And - yes but not only that
 (6) Q What else besides that?
 (7) A That would be the estimates of fry in the nursery lakes and
 (8) the estimate of the condition in the fry
 (9) Q The number of fry at least in the fall surveys have been
 (10) pretty high haven t they?
 (11) A Yes And it s the ratio that was my point They are
 (12) producing a lot of fry but they weren t surviving the winter
 (13) Q Let s stay with what s in the lake They aren t surviving
 (14) the winter because of the smolt counts?
 (15) A That s correct
 (16) Q So it basically comes back to the smolt counts You re
 (17) assuming that those smolt counts are reasonably accurate?
 (18) A Yes that s right
 (19) Q Now the smolt counts are based upon a pretty small
 (20) percentage aren t they?
 (21) Well let me back up a minute There are smolt traps that
 (22) they use to arrive at these smolt counts?
 (23) A Yes
 (24) Q And they basically use the traps to catch a certain number
 (25) of smolt?

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- (1) A Yes
 (2) Q And they think that what they are catching - if I
 (3) understand it right correct me if I m wrong I m sure you
 (4) will They think that what they are catching is about - what
 (5) they actually catch in the traps is one percent or less of the
 (6) total number of smolt that are coming through the river?
 (7) A Yes As an average I think so yes
 (8) Q And in fact the ADF&G is not all that sure about its smolt
 (9) counts being all that accurate is it?
 (10) A There is some concern that they have for the accuracy of
 (11) those counts yes as with all such sampling programs
 (12) Q And in fact in making their forecasts for I believe it s
 (13) this year you recall that they expressed some question as to
 (14) what - how accurate their smolt counts really were?
 (15) A Yes The way that I would interpret what they said they
 (16) know it s going to be low they just can t be sure how low
 (17) Q Let s see do we have - let s just take a look at that
 (18) 2389 You may have it up there Dr Mundy
 (19) Let s see you have it there?
 (20) A Yes
 (21) Q They say in there that there is a strong possibility that
 (22) the traps cannot be used to estimate the number of age two
 (23) smolt?
 (24) A Yes that s correct
 (25) Q And you agree with that?

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- (1) A Yes
 (2) Q And then they go on to point out that therefore there is
 (3) the potential for significant error in the Kenai River
 (4) forecast?
 (5) A Yes
 (6) Q And if the smolt data are incorrect the forecast will be
 (7) low by one and a half million fish returning to the Kenai River
 (8) this year?
 (9) A If that s their judgment I would go with it
 (10) Q Now is it correct to say that you don t - well let me
 (11) back up for a minute
 (12) You showed us some charts and some graphs and there were
 (13) three years of high escapements in a row is that right?
 (14) A Yes
 (15) Q 1987 1988 and then 1989?
 (16) A Yes
 (17) Q Now let s stay with 1989 the last of those three years
 (18) for a moment You haven t made any calculation have you as
 (19) to how much of that overescapement if any would have
 (20) occurred
 (21) even if there hadn t been an oil spill?
 (22) A Yes that s correct I haven t made any such calculations
 (23) Q What you were talking about earlier was basically the
 (24) impact of the entire escapement in excess of the goal in 1989?
 (25) A Yes
 (26) Q Now would you agree that the setnetters caught at least

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- (1) some of the fish that the driftnetters would have caught if the
 (2) driftnetters would have been allowed to fish?
 (3) A Yes
 (4) Q Let me just see if I can get a number from you here I
 (5) think this is one you gave me in your deposition but you
 (6) believe that a normal harvest rate if the driftnetters would
 (7) have been allowed to fish would have been in the 70 to 75
 (8) percent range?
 (9) A The overall harvest rate for Upper Cook Inlet on sockeye
 (10) with both gear types?
 (11) Q Well whatever you were referring to in your deposition
 (12) when you gave me that number
 (13) A The combined driftnet and setnet operation is capable of
 (14) taking from 50 to 90 percent of the run 70 percent is a good
 (15) average
 (16) Q Well I think the way you put it was that you believed that
 (17) a harvest rate had the driftnetters been able to fish was 70
 (18) to 75 percent?
 (19) A Well if you re referring to part of my deposition I d
 (20) like to see the context of that because all I can tell you on
 (21) that is that 70 percent or 75 percent is a good average They
 (22) can take 90 percent if they are - they are capable of taking
 (23) the 90 percent I think as much as up to 90 percent
 (24) Q Let s see do you have - I think you ve got a copy of your
 (25) deposition Maybe you don t

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- (1) A The what?
 (2) Q Do you have a copy of your deposition?
 (3) A What number?
 (4) MS STEWART It s on top
 (5) THE WITNESS I ve been shuffling the deck
 (6) BY MR COOPER
 (7) Q At least you haven t knocked it over yet
 (8) I think that s at 4142
 (9) A Okay I have it
 (10) Q Let s see if I m reading this right it looks to me like
 (11) you said these harvests methods have proven highly effective
 (12) Cook Inlet giving harvests rates on the order of 70 to 80
 (13) percent of the available fish And then you go on to take -
 (14) it s my judgment that had the fleet been able to fish in 1989
 (15) that would have achieved a harvest rate on the order of 70 to
 (16) 75 percent?
 (17) A Right In the context of which that s offered that s my
 (18) judgment of an average an average figure
 (19) Q Well I guess the way to - the question was asked and the
 (20) way you were answering it was - you thought the average
 (21) would
 (22) have been achieved in 1989?
 (23) A Yeah and that s the likely percent based on the historical
 (24) average with no other considerations involved in it
 (25) If I may explain since there were two previous high
 (26) escapements in 1987 and 1988 the manager being worried
 (27) about

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- (1) damage to the nursery lakes I m not completely comfortable
 (2) with an average rate in the situation because I think the
 (3) manager would have pulled out all the stops and thrown
 (4) everything at his disposal to stop it So 70 percent is the
 (5) mathematical average of what you could expect the combined
 (6) gillnet fleet and setnets to harvest
 (7) However given the fact - you also - having been a
 (8) fishery manager and harvest manager and written fishing
 (9) regulations I think there is a certain psychology involved
 (10) that the numbers - the manager doesn t get - I m sure the
 (11) manager who is an experienced manager been there since
 (12) 1980
 (13) would have gone after that Kenai run with everything at his
 (14) disposal if he had something at his disposal
 (15) Q Well Dr Mundy are you saying now that you were wrong
 (16) when you said in your deposition that it was your judgment the
 (17) had the fleet been able to fish in 1989 they would have
 (18) achieved a harvest rate on the order of 70 to 75 percent?
 (19) A Well that s the way I saw it at that time but I may not
 (20) have been thinking about the fact that the measuring was
 (21) looking at - let me back up here a little bit
 (22) I may have not have been thinking about the fact that the
 (23) manager would have had to deal with two consecutive large
 (24) escapements and other things like that I was giving you an
 (25) average figure and you asked me what they expected and
 (26) that s
 (27) still my answer today They expected a catch rate and in that

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- (1) fishery would have been the average and yes it would but
 (2) I m qualifying my information so the people have an
 (3) understanding how the fishery management works the
 (4) mathematical and numerical average may not be the one that s
 (5) most appropriate
 (6) Q But it was your best estimate at the time?
 (7) A It was and is of the average
 (8) Q Now isn t it true that you believe that there were
 (9) problems that were evident in those lakes Kenai and Skilak
 (10) lakes before the fry from the 1989 escapement ever entered
 (11) them?
 (12) A What do you mean by problems?
 (13) Q Well -
 (14) A Was aware of any problems?
 (15) Q Let s take that one Were you aware of any problems in -
 (16) A No
 (17) Q Is it your belief then that in fact - well do you know
 (18) whether the lakes would have experienced the same drop in
 (19) production that you believe they are experiencing as a result
 (20) of the 87 and 88 escapements without regard to what
 (21) happened
 (22) in 1989?
 (23) A No that s not my opinion
 (24) Q It s your belief that it s the 89 - well let me ask you
 (25) it the other way around
 (26) Do you believe that the 89 overescapement would have

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- (1) produced the result that you think is in fact going to happen
 (2) if there had not been an 87 and 88 high escapement?
 (3) A I don t know I don t have any way of knowing
 (4) Q Well in your deposition there on page 77 look at lines
 (5) three - starting at line three through about line 20 Do you
 (6) recall there that I asked you with respect to Kenai and Skilak
 (7) Lake that s the Kenai system that we re talking about if
 (8) you ve tried to reach an opinion whether the ability of those
 (9) lakes to produce smolt would have been damaged to the same
 (10) extent that you think has actually occurred of as a result of
 (11) the 87 and 88 overescapements without regard to what
 (12) happened
 (13) in 89 Do you remember I asked you that question?
 (14) A Yes I see it here
 (15) Q And you answered no And then I said you don t have an
 (16) opinion one way or the other on that and you answered no I
 (17) have no way to say?
 (18) A That s correct
 (19) Q And that was your view last year when I took your
 (20) deposition?
 (21) A Yes
 (22) Q And that s still your view today?
 (23) A No
 (24) Q It s not your view today?
 (25) A No I mean this was May of 1993 and I ve had a chance to
 think about it a little bit

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- (1) Q Well let s see I ve taken your deposition on several
 (2) times since May of 93 haven t I?
 (3) A Yes
 (4) Q As late as what about a week or two ago?
 (5) A Yes
 (6) Q And do you recall I asked you a week or two ago if you
 (7) arrived at any different conclusions or if you ve done any new
 (8) work?
 (9) A I don t recall that you asked me this question at that
 (10) time Mr Cooper Perhaps you did
 (11) Q Well in any event in the course of those depositions over
 (12) the last year you never mentioned to me that you had changed
 (13) your mind on this point did you?
 (14) A I can only respond to the questions I m asked during my
 (15) depositions
 (16) Q And you didn t produce any supplemental report on this new
 (17) conclusion that you ve come to?
 (18) A I think it follows from the data that you see up there if
 (19) the 1987 run had seriously - had reduced the amount of food in
 (20) the nursery lakes or whatever problem because I don t really
 (21) have any way of knowing what exactly happened in the nursery
 (22) lakes except something happened that doesn t allow the fry to
 (23) get enough food to make it through the winter if something had
 (24) actually happened then the 1988 fish would have been
 (25) disadvantaged You would have seen a very low smolt
 production

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- (1) out of there if the 87 overescapement had done it
 (2) So I m not saying that an overescapement always damages a
 (3) nursery like that That s not the case The chances are
 (4) judged by the managers The chances of damage are high
 (5) enough
 (6) that they don t like to have that happen they try to avoid
 (7) having that happen and sometimes you can get away with an
 (8) overescapement and sometimes you can t
 (9) And the fact that the 88 brood year that I ve had a chance
 (10) to look at and think about it the fact that the 88 brood year
 (11) was able to produce good smolts with relatively small
 (12) escapement leads me to conclude that the 87 escapement
 (13) probably wasn t the primary cause or the most important cause
 (14) of the problems that you re seeing in the lake now
 (15) On the other hand I can t tell you that it had nothing to
 (16) do with it It may have had something to do with it and I
 (17) can t tell you it didn t
 (18) Q Well you mentioned another point in the course of that
 (19) answer that I wanted to ask you about You don t really know
 (20) do you what the mechanism is by which the overescapements
 (21) or
 (22) overescapement whichever ended up causing a food problem
 (23) in
 (24) the lakes?
 (25) A In this specific instance?
 (26) Q Yes
 (27) A That s correct
 (28) Q And you can t - you re not a limnologist right?

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- (1) A That s right
 (2) Q A limnologist is somebody who would specialize in the study
 (3) of lakes like these to understand what may be happening in
 (4) them?
 (5) A Right I have worked in oceanography which is a closely
 (6) related field and I use that data but I m not a limnologist
 (7) Q So whatever it may be that s going on in there you don t
 (8) really know how that s working?
 (9) A That s correct
 (10) Q On that point - and I guess one thing that can happen to
 (11) salmon fry is they can get eaten by other critters?
 (12) A Yes
 (13) Q And at least one possibility that may be happening in the
 (14) lake is predation?
 (15) A Yes
 (16) Q The theory that you have that there must be some kind of a
 (17) food problem up there you re aware aren t you that the
 ADF&G
 (18) has in fact looked at the zooplankton abundance in those
 (19) lakes?
 (20) A Let me clarify my opinion about that I think that the -
 (21) that it s likely there is a food problem up there that s the
 (22) most likely explanation as we ve been over a number of times
 (23) I don t know exactly what the problem is
 (24) Q But you re aware that the ADF&G has measured food
 abundance
 (25) in those lakes?

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- (1) A Yes I m aware of those studies
 (2) Q And they didn t find any major reduction in zooplankton?
 (3) That s the food these little critters eat?
 (4) A Right they didn t find any major reduction
 (5) Q There was one other lake where they had too many salmon
 fry
 (6) entered the lake and ultimately the system collapsed for at
 (7) least some period of time?
 (8) A There has been a number of studies That one is best
 (9) known
 (10) Q In that one there was a major change in the food production
 (11) there the production of zooplankton associated with that
 (12) wasn t there?
 (13) A Yes
 (14) Q Let me ask you a few questions about the Kodiak lakes I
 (15) think if I recall correctly you addressed was it Ayakulik -
 (16) no I m sorry Red Lake?
 (17) A Yes Red Lake
 (18) Q Just Red Lake?
 (19) A That s correct
 (20) Q Does Red Lake have on it - the river for Red Lake is not
 (21) Red River Is it?
 (22) A It depends I m not sure
 (23) Q Is it the Ayakulik?
 (24) A It may be called that The fishing district that s
 (25) associated with it is called the Ayakulik so it might be a

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- (1) good guess
 (2) Q Does the Ayakulik have a weir across it?
 (3) A Yes
 (4) Q When you were with the ADF&G did you do work in the
 Kodiak
 (5) area?
 (6) A I worked in the westward region My experience on Kodiak
 (7) per se in the Kodiak management area is somewhat limited
 (8) I m more familiar with the Chignik management area
 (9) Q But you re familiar enough to know if there was a weir
 (10) across the river?
 (11) A I haven t actually been to the weir but I ve seen
 (12) references to the fact that there is
 (13) Q And I think somebody testified yesterday what a weir was
 (14) but basically that s a device that can be used to shut off the
 (15) river to the fish if somebody had so desired to do that?
 (16) A The Canadians call a weir a fence a fish fence It s like
 (17) putting a fence through the middle of the weir If you close
 (18) the weir and the water levels were low enough that would stop
 (19) the migration that s right
 (20) Q There was a boycott by fishermen in 1991 Do you
 remember
 (21) that?
 (22) A Specifically I don t
 (23) Q Well if you don t remember it then you probably won t be
 (24) able to answer my next question I was going to ask you if it
 (25) wasn t the case that several weirs were closed during 1991 to

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- (1) prevent excess fish from entering systems while the fishermer
 (2) were boycotting and refusing to fish?
 (3) A I m not - I m not familiar with it
 (4) Q I think Dr Mundy that that was probably my last question
 (5) for you if you just let me take one quick look at my notes
 (6) I did have one other question for you When you were with
 (7) the ADF&G you learned or maybe even before that you
 learned
 (8) that there was a sonar counting unit on the Kenai River?
 (9) A Yes I m familiar with the sonar counting operations in
 (10) the State of Alaska
 (11) Q That - incidentally now that sonar counting device is
 (12) used to count fish going up the river the adults coming back?
 (13) A That s correct in the Kenai River that s what it s used
 (14) for
 (15) Q That s something different than the smolt traps that are
 (16) used to count the smolt?
 (17) A Sonar is used to count smolts but not in the Kenai River
 (18) They simply use a trap
 (19) Q And the smolts are what s going out of the river and they
 (20) come back as adults and that s when they pass through the
 (21) counter?
 (22) A That s correct
 (23) Q Now when you were working for the ADF&G you never had
 any
 (24) reason to think that the counter on the Kenai was providing
 (25) data that was significantly wrong did you?

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- (1) A Statisticians often hesitate The word wrong has a lot of
 (2) different connotations I had no reason to expect that I
 (3) couldn't use that data to manage that fishery which was what
 (4) was important to me
 (5) Q You had no reason to think that the equipment was not
 (6) accurate?
 (7) A I had no specific reason to believe it was inaccurate no
 (8) MR COOPER No further questions Your Honor
 (9) THE COURT Redirect
 (10) REDIRECT EXAMINATION OF PHILLIP MUNDY
 (11) BY MR JAMIN
 (12) Q Let me ask you first Dr Mundy you were asked if you had
 (13) quantified after the spill the effects on the pink salmon
 (14) You're not saying as I understand it that the Exxon Valdez
 (15) oil spill is the exclusive cause of what you've described in
 (16) Exhibit 3183 the one that we had up with 91 92 and 93 of
 (17) all the damage is that right?
 (18) A Well with respect to the 90 and 91 figure I am
 (19) however that's not correct with respect to the 92 and 93
 (20) figure These are four different kinds of numbers and I tried
 (21) to explain how they were calculated but the first two numbers
 (22) are actual damages that in my opinion can be attributed to the
 (23) Exxon Valdez And the last two numbers are negative
 (24) deviations
 (25) Q So as to the first two figures you are saying it's the

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- (1) exclusive cause?
 (2) A Yes
 (3) Q And as to the last two figures is it your opinion that the
 (4) Exxon Valdez oil spill is a substantial contributing factor to
 (5) the range of damages that you had on that exhibit?
 (6) A Yes
 (7) Q All right A couple other things for clarification You
 (8) were shown 2389 which was Mr Tarbox's preliminary forecast
 (9) of
 (10) the 1994 run Can you get that back in front of you? If not
 (11) I can come up with the Court's permission
 (12) A I have it
 (13) Q And Mr Cooper asked you if the smolt data are incorrect
 (14) the forecasts might likely be low and did Mr Tarbox go on to
 (15) say in contrast if the smolt data are correct the forecast
 (16) would be 5 million fish too high?
 (17) A Yes that's correct That's on the second page
 (18) Q Now we talked a little bit about Mr Spies Mr Spies is
 (19) not a salmon biologist is that right?
 (20) A No Dr Spies is a - my understanding he's a
 (21) toxicologist and a physiologist
 (22) Q Could you get in front of you 5983 which was the five
 (23) years later report?
 (24) A I have it
 (25) Q Let's go to page 13
 (26) A I have it

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- (1) Q Did Mr Spies write at the top As the oil moves through
 (2) Prince William Sound and out into the Gulf of Alaska the
 (3) slicks were also swept into the mouths of streams where salmon
 (4) breed and where the salmon fry were soon to emerge from the
 (5) gravel and find their way to saltwater?
 (6) A Yes
 (7) Q Did he write 75 percent of the wild pink salmon in the
 (8) Sound spawn at the mouth of streams?
 (9) A Yes
 (10) Q Did he say that There was no apparent change in the use
 (11) of this habitat by fish in the summer of 1989 and many salmon
 (12) deposited their eggs in the intertidal portion of oiled
 (13) streams?
 (14) A Yes
 (15) Q Did he say In the autumn of 1989 egg mortality in oiled
 (16) streams averaged about 15 percent compared to about 9
 (17) percent
 (18) in unoiled streams?
 (19) A Yes
 (20) Q Did he go on to say that Since 1989 egg mortality in the
 (21) oiled areas has generally increased?
 (22) A Yes
 (23) Q Did he go on to say that In 1991 and 1992 approximately
 (24) 40 to 50 percent of the salmon eggs in oiled streams did not
 (25) survive as compared to an 18 to 30 percent mortality in unoiled
 (26) streams?

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- (1) A Yes
 (2) Q Did he go on to say that In 1993 though the rates of egg
 (3) mortality had dropped to an average of less than 25 percent in
 (4) oiled streams and less than 15 percent in unoiled streams the
 (5) differences still persisted?
 (6) A Yes
 (7) Q Did he say Although the differences between salmon egg
 (8) mortality and oiled and unoiled streams over the first two
 (9) years were likely attributable to the effects of oil scientists
 (10) did not expect these differences to persist as long as four
 (11) years after the spill At first they thought oil was directly
 (12) affecting survival of the pink salmon eggs but as the amount
 (13) of oil on the shorelines decreased other explanations began to
 (14) seem more plausible Perhaps there was a genetic effect which
 (15) young that carried over into adulthood and was inherited by the
 (16) next generation?
 (17) A Yes
 (18) Q Did he say In 1993 the story took another turn
 (19) Returning adult pink salmon were captured as they entered
 (20) oiled
 (21) and unoiled streams their eggs spawned in the laboratory and
 (22) raised under controlled conditions This experiment showed
 (23) that the differences in egg mortality between pink salmon from
 (24) the oiled and unoiled streams when both were raised in the
 (25) laboratory were as great as the differences seen in the wild
 (26) essentially eliminating environmental factors from

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- (1) consideration?
- (2) A Yes
- (3) Q Did he go onto say that It now appears there is an
- (4) inheritable difference in egg mortality for fish from oiled
- (5) versus unoiled streams?
- (6) A Yes
- (7) Q Mr Cooper asked you sir about the 89 pink salmon that
- (8) were coming out of the streams in 1989 he asked you some
- (9) questions about opportunities for contact with the oil he was
- (10) asking you about unoiled streams Let me call up 303 if I
- (11) may
- (12) Now as I understand it sir you have an understanding
- (13) that the oil plume started in Bligh Reef and worked its way in
- (14) a generally southwestern direction?
- (15) A That s correct
- (16) Q And Mr Cooper focused on streams for a portion of his
- (17) questioning about the streams in the southwestern area?
- (18) A Yes
- (19) Q Now for the fish emerging from the other areas that were
- (20) in areas that were generally unoiled did they have an
- (21) opportunity later in their lives to come in contact with that
- (22) southwestern area?
- (23) A Yes Generally most biologists who have worked in this
- (24) area have the opinion that the salmon finger links when they
- (25) grow and as they grow they move toward the southwestern
- area

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- (1) and exit by the side of Montague Island and in those passes
- (2) Q So they go right out through here don t they sir?
- (3) A Yes
- (4) Q How about those hatchery fish where the hatcheries were
- (5) unoiled?
- (6) A Well I wouldn t expect their patterns of juvenile
- (7) migration to be any different than those of the wild fish
- (8) They would exit through the southwestern district
- (9) Q All right Now you were asked about Cook Inlet reds a
- (10) bit and the suggestion was we don t know about 1994 returns
- in
- (11) Cook Inlet Do we know anything yet about the returns to
- (12) Kodiak into that Red Lake system how does it look down there?
- (13) A I discussed the progress of the Red Lake run with the
- (14) assistant area biologist and as of yesterday they had about
- (15) 96 000 adults through the weir up there which is about on
- (16) target for the forecast He believes that the forecast is
- (17) still valid but is concerned because the harvest level of
- (18) 175 000 that s a very small harvest from this area and they
- (19) can take that very quickly
- (20) So apparently he s going to wait until towards the end of
- (21) the season before he allows any fishing so they can be sure
- (22) they have got their escapement so he s definitely in a holding
- (23) mode and he s got some concern over how that is because the
- (24) problems they found in the nursery lakes
- (25) Q And it s that forecast that you rely on in your damage

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- (1) calculation?
- (2) A That s right
- (3) MR JAMIN I d like to move for the admission of
- (4) 5983
- (5) (Exhibit 5983 offered)
- (6) MR COOPER He read most of it in there Your Honor
- (7) I d like to take that up with counsel Your Honor before we
- (8) get your resolution on that
- (9) THE COURT Why shouldn t it be admitted when both of
- (10) you have relied on it?
- (11) MR COOPER There are portions of it that we have
- (12) both relied on There are other portions that have nothing to
- (13) do with the issues in this case That s the only reason
- (14) THE COURT See if you can work it out
- (15) MR JAMIN We will try
- (16) You can step down I ll gather those documents
- (17) MR O NEILL Plaintiffs call James Crutchfield
- (18) THE CLERK Raise your right hand
- (19) (The Witness Is Sworn)
- (20) THE CLERK Please be seated For the record sir
- (21) state your full name your address and spell your last name
- (22) please
- (23) THE WITNESS My name is James Arthur Crutchfield Jr
- (24) C R U T C H F I E L D My address is 5215 East Harbor Drive
- (25) Friday Harbor Washington

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- (1) DIRECT EXAMINATION OF JAMES CRUTCHFIELD
- (2) BY MR O NEILL
- (3) Q Just so we know where we re going you re a fishery
- (4) economist?
- (5) A More broadly a natural resource economist with a heavy
- (6) concentration in fisheries
- (7) Q Where did you go to school?
- (8) A I have bachelor s and master s degrees from UCLA and a
- (9) Ph D from the University of California at Berkley
- (10) Q What were your degrees in?
- (11) A Economics for the bachelor s economics and political
- (12) science for the master s and economics for the Ph D
- (13) Q And have you had any experience with regard to teaching in
- (14) colleges or schools?
- (15) A 40 years I taught at Berkley for two years and then moved
- (16) to the University of Washington and was there until I retired
- (17) in 1982 and then was asked to stay on a contract basis until
- (18) 1988
- (19) Q And were you a professor at the University of Washington?
- (20) A Yes assistant associate and then professor
- (21) Q And then a professor at Meredith?
- (22) A Yes
- (23) Q Being a professor at Meredith means you don t have to work
- (24) anymore?
- (25) A Means it s without merit

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- (1) THE COURT I didn't hear that
 (2) BY MR O NEILL
 (3) Q And then in 1982 you went into the consulting business?
 (4) A Actually I had started the association with NRC a year
 (5) earlier I was one of the original partners in NRC and have
 (6) remained active on about a half time basis ever since
 (7) Q And NRC is Natural Resource Consultants?
 (8) A That's correct
 (9) Q I want to talk about some special assignments and some of
 (10) your activities over the years Have you ever done anything
 (11) for the United Nations?
 (12) A Yes I did quite a number of assignments for the UN I
 (13) did this in choice rather than take sabbaticals I worked for
 (14) the food and agriculture association of the UN and on a couple
 (15) occasions the United Nations Development Program Most of
 (16) that
 (17) work was centered in Africa Uganda I also did some work for
 (18) FOA in South America and some in southeast Asia
 (19) Q Have you done any work in China?
 (20) A No
 (21) Q Have you done any advising with regard to China?
 (22) A No none at all
 (23) Q I'm sorry Have you done any work with government
 (24) agencies?
 (25) A Yes a considerable amount I was a member of the Stratton
 Commission some years ago and the general program with the

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- (1) United States and the sea I've done a considerable number of
 (2) contract research jobs for various agencies of the government
 (3) the Old Borough of Commercial Fisheries the National Marine
 (4) Fisheries Service some work on weather modifications and a
 (5) number of others in the area of water resources
 (6) Q Have you done any work with regard to Ireland?
 (7) A Yes I've had five contracts in Ireland three - actually
 (8) four of which involved salmon fisheries One was an attempt
 (9) to outline a plan for a five-year program of expansion in the
 (10) Irish fisheries which had been held down prior to their
 (11) independence Another was a study of proper management
 (12) measures for salmon in Ireland and a third had to do with the
 (13) impact of aquaculture salmon aquaculture on the economy
 (14) and
 (15) environment in Ireland
 (16) Q Have you done any work with regard to oil spills in the
 (17) past the impacts of oil spills on the price of fish?
 (18) A Yes I did quite a bit of work in the Glacier Bay case in
 (19) 1987 in analyzing and forecasting what the price would have
 (20) been absent the Glacier Bay spill
 (21) Q And the 1987 Glacier Bay oil spill was here in Cook Inlet
 (22) Alaska?
 (23) A Yeah Upper Cook Inlet
 (24) Q And disrupted the 1987 salmon season?
 (25) A Yes It occurred right at the beginning of the season
 I also had an assignment to do the analysis of price

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- (1) impacts in the Braer spill the spill that occurred in the
 (2) Shetland Islands just a while ago
 (3) Q What work did you do with regard to the Braer spill
 (4) specifically?
 (5) A We the team that went over tried to determine the impact
 (6) of the oil spill which closed down a considerable number of the
 (7) salmon farms in the Shetlands whether it had any impact on the
 (8) prices of salmon in the areas that remained open and were
 (9) marketed during that period
 (10) We also took a look at whether or not there was any
 (11) lingering impact after the initial shock of the spill
 (12) Q In the course of your work are you familiar -
 (13) MR O NEILL It's 12:00 Judge I'll stop
 (14) mid-question
 (15) THE COURT We can take our second recess We will be
 (16) in recess for 15 minutes please
 (17) (Jury out at 12:00)
 (18) (Jury in at 12:15)
 (19) BY MR O NEILL
 (20) Q Have you written articles on salmon prices?
 (21) A I'm sorry?
 (22) Q Have you written articles on salmon and prices?
 (23) A Yes quite a number of them and early on a book on the
 (24) salmon industry which was published in 1961 I believe
 (25) Q Was it a bestseller?

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- (1) A I still have copies available
 (2) Q You were a member the Snake River salmon recovery team
 (3) or
 (4) at least you were until recently?
 (5) A I was until last week I was charged with developing a
 (6) recovery plan for Snake and Columbia River species listed as
 (7) endangered or threatened
 (8) Q To shortcut this you've had experience throughout your
 (9) career in the area of economics?
 (10) A Yes I have
 (11) Q And fish?
 (12) A And fish
 (13) Q And you've looked specifically at the questions of the
 (14) impact of oil spills on fish prices with regard to the 1987
 (15) Glacier Bay spill and the Braer spill?
 (16) A Yes
 (17) Q And you've educated yourself and worked in the area of
 (18) farmed salmon with regard to the Republic of Ireland?
 (19) A Right
 (20) Q And you have knowledge of the Japanese fish market?
 (21) A Yes I do
 (22) Q And as a result of your general studies and your earlier
 (23) investigations with regard to both the 1987 Glacier Bay spill
 (24) and this spill you're familiar with how fish are bought and
 (25) sold red salmon are bought and sold in specifically Cook
 Inlet Alaska?

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- (1) A Yes I am
 (2) Q And you have been qualified to testify as an expert witness
 (3) in various federal courts?
 (4) A I have
 (5) Q Including the State of Alaska?
 (6) A Yes
 (7) MR O NEILL I would offer Dr Crutchfield as a
 (8) fisheries economist
 (9) MR LYNCH I have no reason to object to his being
 (10) qualified as an expert Your Honor
 (11) THE COURT Dr Crutchfield s qualifications are
 (12) accepted
 (13) BY MR O NEILL
 (14) Q I want to talk specifically today it s essentially a case
 (15) study on Upper Cook Inlet red salmon and the Exxon oil spill
 (16) A Yes
 (17) Q So the jury knows that s going to be the one species of
 (18) salmon we re going to look at in detail and then we ll value
 (19) that with another expert including pinks but we re going to
 (20) take one specific slice through the pie and look at red salmon
 (21) and Upper Cook Inlet
 (22) A Yes
 (23) Q Where are red salmon Upper Cook Inlet salmon sold?
 (24) A Some small amount are canned and sold mainly in the United
 (25) States and the UK The overwhelming majority of it is frozen

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- (1) and sold in Japan Approximately 98 to 99 percent of the
 (2) frozen pack is sold in Japan
 (3) Q Now I m going to have you take a fish off the boat from
 (4) the time the fisherman catches it and I want you to trace that
 (5) fish for us through to the consumer in Japan
 (6) A Well I ll have to shorten it a bit at the Japanese end
 (7) but very briefly the fish are landed in Cook Inlet sold to
 (8) American processors and the processing consists largely just
 (9) of heading gutting and freezing There are some variations of
 (10) that but the bulk of the pack is sold like that The fish are
 (11) transferred sometimes on the basis of a fixed contract price
 (12) sometimes on the basis of a grounds price plus a markup
 (13) sometimes on some variation of these two and at times the
 (14) price is not finalized until well into the season
 (15) The fish are shipped out generally pretty rapidly from the
 (16) American processor to transportation to Japan I say American
 (17) processor although the bulk of these processors do have direct
 (18) contacts with Japanese interests They either have an equity
 (19) interest in the firm or they finance the American firm In any
 (20) case they are the principal buyers of the product the firm
 (21) has
 (22) They are shipped out pretty rapidly because they don t want
 (23) to hold them any longer than they have to it s an expensive
 (24) inventory They then go to Japan via trading firm and there
 (25) are several avenues they can go to thereafter Most of them

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- (1) will go through a trading firm to a wholesaler and then out to
 (2) a secondary wholesaler and to retailers restaurants so on
 (3) from there
 (4) There are some 54 of these wholesale markets in Japan in
 (5) which the Tokyo Central Wholesale Market is one of the
 (6) largest There are I think about seven or eight that handle
 (7) the bulk of the catch Some of the fish however may be
 (8) bypassing that avenue and are going directly to large chain
 (9) retailers which are growing rapidly in Japan as most other
 (10) places and so they may bypass the traditional wholesale
 (11) function Or a better way to say it the large buyer performs
 (12) the wholesale functions himself
 (13) There are a lot of variations on that with sales to smaller
 (14) subwholesalers sales to smaller retailers and other areas of
 (15) sales directly to large restaurant groups but those are
 (16) basically the channels
 (17) Q Now you used an expression the grounds price What is
 (18) the grounds price?
 (19) A That s the price paid to fishermen in Upper Cook Inlet for
 (20) reds
 (21) Q On occasion people also use the ex vessel or off the vessel
 (22) price?
 (23) A That tends to be used in exactly the same way same ways
 (24) Q I want to focus on the bottom end of the chain of
 (25) distribution The cannery sets a price for the fishermen The

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- (1) cannery besides -
 (2) A You use the word cannery Actually processor
 (3) Q Used to be called cannery The processor deals with the
 (4) fishermen with regard to the purchase of the fish and then the
 (5) processor sells the fish to a buyer often a Japanese buyer?
 (6) A Right
 (7) Q We re talking specifically right now red salmon?
 (8) A Correct
 (9) Q Now would you talk for a minute - you mentioned the Toky
 (10) Central Wholesale Market Would you talk about that for a
 (11) minute Tell us what it is what economic function it plays
 (12) A It s a very large wholesale market Performs a tradtional
 (13) wholesale function of bringing together in one place large
 (14) amounts of fish many varieties of fish many processed forms
 (15) Within the market there are several categories of buyers
 (16) some of whom are able to resell within the market some can
 (17) only buy within the market and then take the fish out There
 (18) are large numbers of sellers well over a thousand and their
 (19) basic economic function really is to integrate the forces of
 (20) supply and demand and set a price for each of the various
 (21) types
 (22) of fish that they handle
 (23) This is the place where most of the market forces come to
 (24) bear on the price of fish in Japan There would be variations
 (25) because there are variations in consumer patterns in different
 parts of the country but generally speaking prices in other

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- (1) markets follow very closely those that are determined in the
 (2) Tokyo wholesale market
 (3) Q So it's a good index of sockeye prices?
 (4) A That's correct
 (5) Q What are the major sockeye prices sold in the Tokyo Central
 (6) Wholesale Market?
 (7) A The majority of it is either salted salmon or frozen
 (8) salmon headed and gutted usually
 (9) Q Now who are the traders?
 (10) A Traders would be buyers who take fish directly from the
 (11) American processor and then move it through these various
 (12) channels that I mentioned. May be large Japanese fishing
 (13) companies, large trading companies, large specialized fish
 (14) companies
 (15) Q And what factors do traders look at with regard to
 (16) purchasing fish, hedging risk, that kind of thing?
 (17) A Dealing particularly with the item in question, sockeye
 (18) salmon from Upper Cook Inlet, it's true of most salmon, the
 (19) fish as you know, run only for a very short period of time.
 (20) That Upper Cook Inlet run is perhaps a month or five weeks
 (21) All of the fish that the traders want to take have got to be
 (22) taken at that time. The fish have got to be caught, then they
 (23) have got to be transferred to the processor, what they aren't
 (24) going to keep, and they are processed and frozen for later
 (25) delivery.

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- (1) Somebody in the distribution chain, the trader or the
 (2) wholesalers, have to hold that inventory for a full year and
 (3) meter it out over the year in response to demand. Hopefully
 (4) they will end up with that year's pack sold ready for the next
 (5) pack. Obviously somebody is taking a substantial risk during
 (6) that period. You have to be able to guess as best you can what
 (7) next year's prices are going to be, what next year's demand
 (8) conditions are going to be and so on.
 (9) It hasn't - it hasn't varied much with the previous years
 (10) back, but it gives an indication what the bargaining for the
 (11) new pack will be.
 (12) Q When do the Japanese traders begin the negotiations with
 (13) the American fish processors over a year's price?
 (14) A It varies with individual companies, but in general the
 (15) negotiations begin to get underway, let's say in terms of
 (16) formation, positions that people are going to take, in the
 (17) first quarter of the year. The negotiations may go on longer
 (18) than that they may be terminated, price may be agreed on early
 (19) in the year.
 (20) Generally speaking, the prices are negotiated at the time
 (21) the fishing season gets underway at a level which is agreed on
 (22) as a level that may get the people out fishing. Can't afford
 (23) strikes in that kind of a flash fishery because it's gone if
 (24) you don't catch them then. So generally the price is set at a
 (25) level which will be sure to induce fishermen to go fishing.

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- (1) Typically the price may go up in steps thereafter during
 (2) the course of the season. On very rare occasions it's gone
 (3) down in the course of a season, but that's roughly the way the
 (4) negotiations take place. Again, some prices may be agreed on
 (5) very quickly, others may not be agreed on until later in the
 (6) season.
 (7) Q Now I want to ask an abstract question and then I'll bring
 (8) the concept to a specific, but with regard to risks in the
 (9) business of trading fish, how does risk relate to price?
 (10) A Let me put it this way. The riskier the situation that the
 (11) trader feels that he's facing, the man who is holding the
 (12) inventory, the greater the tendency he will have to acquire his
 (13) fish, so it's the lowest possible price he can to hedge that
 (14) risk as far as possible.
 (15) There are no ways of evening it out. If you go very wrong
 (16) on the price of the fish you buy and take a big hit that year,
 (17) you don't get to recover it next year, you're gone. So it's a
 (18) very tough bargaining situation, it requires a great deal of
 (19) knowledge on the part of the buyer as to all of the factors
 (20) that are going to impact the price of fish. Competition from
 (21) other types of fish, the level of income in the country,
 (22) variety of things of that sort.
 (23) Q Did the trade cover the Exxon Valdez oil spill?
 (24) A They did indeed. Anybody who is concerned with acquiring
 (25) red fish for his industry had to be concerned with what

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- (1) obviously was a major impact on the fishery. It was widely
 (2) known, immediately known and closely followed throughout the
 (3) time.
 (4) Q What kind of impacts as a general proposition do oil spills
 (5) have on the market of salmon?
 (6) A Fortunately we don't have too much experiences to draw on,
 (7) but the ones we've had indicate that the general impact centers
 (8) on uncertainty about the effect on demand, whether or not there
 (9) is going to be a widespread fear on the part of the public of
 (10) tainting or even a risk to life of eating tainted fish.
 (11) More specific, it has an impact on the trade. The consumer
 (12) may not be in a motion to judge very accurately what the impact
 (13) will be on it, but the trader knows, and so a spill is likely
 (14) to have the effect, but increasing the uncertainty of the
 (15) situation he faces, making him a very much tougher bargainer
 (16) about the price at which he acquires his fish.
 (17) Q And if the trader is an uncertain bargainer or a tougher
 (18) bargainer with regard to the uncertainty of the processor, as a
 (19) general proposition does that have an impact on the price paid
 (20) to the fishermen?
 (21) A Yes, it does. The bargaining process in a sense is almost
 (22) a game. There is a gap between what the fishermen is willing
 (23) to accept before he quits fishing and the price that a
 (24) wholesaler can pay or a trader can pay and come out with his
 (25) purchase, and that gap is not fixed, it can be quite wide.

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- (1) Who wins the game who gets the price closest to his limit
 (2) depends on what bargaining tools he has at the time And the
 (3) three cases that we've seen seem to indicate that the spill has
 (4) the effect among other things of giving a tremendously strong
 (5) bargaining tool to the buyer and as a result the price tends to
 (6) be as low as he can possibly push it to hedge against the risk
 (7) of uncertain and perhaps disastrous results on his inventory
 (8) and his business
 (9) Q And that eventually affects the price that the fishermen
 (10) gets from the processor?
 (11) A Right Actually it's almost a direct affect because the
 (12) processor feels the Japanese pressure very very quickly and
 (13) he adjusts to that by pricing downward to the fishermen
 (14) Q Now I want to go through the three specific situations that
 (15) you've looked at with regard to oil and salmon and that is the
 (16) 87 Glacier Bay spill the Braer spill and the Exxon Valdez
 (17) spill
 (18) A Yeah
 (19) Q You studied extensively the 1987 spill from the Glacier Bay
 (20) in Cook Inlet?
 (21) A Right
 (22) Q And that was a relatively small oil spill?
 (23) MR LYNCH Your Honor may I - may we have a side
 (24) bar?
 (25) (At side bar off the Record)

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- (1) MR SCHROER Brian you're on the mike
 (2) MR O NEILL Did you guys hear? No problem
 (3) JURORS No
 (4) BY MR O NEILL
 (5) Q I want to talk about what you studied with regard to the
 (6) Glacier Bay spill
 (7) A Right We were charged with the responsibility for making
 (8) an estimate of what the price might have been absent the
 (9) spill We took a careful look at all elements of the market
 (10) that we felt would bear on that conditions in the Japanese
 (11) market conditions that we could discern from trade literature
 (12) as to what the market might have been prior to the time the
 (13) spill occurred supply conditions forecasts for supplies from
 (14) all areas of Alaska which would be available by the first
 (15) quarter to try to get a general picture of the market and what
 (16) it would have been had there not been a major perturbing
 (17) incident
 (18) Q Did you conclude as a result of your studies that the
 (19) Glacier Bay oil spill had an adverse impact on the price of red
 (20) salmon paid to fishermen and then up again through the chain
 (21) of distribution?
 (22) A Yes it did have an adverse effect It showed up in a
 (23) sharp drop in the price of fish price paid to fishermen in
 (24) Upper Cook Inlet right in the middle of the season a drop
 (25) which didn't show up in the other so called local areas

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- (1) That's all the red areas other than Bristol Bay it didn't show
 (2) up in them at all but it did show up in this area And the
 (3) result was a significant decline in price paid to the
 (4) fishermen about 20 cents a pound which we could not explain
 (5) in terms of the opportunities that appeared in the market or
 (6) the prices being paid elsewhere in the area
 (7) Q As a result of your study of the Glacier Bay spill did you
 (8) come to any conclusions about whether fish buyers were
 (9) concerned enough to pay less for Upper Cook Inlet sockeye
 than
 (10) they would have had there not been an oil spill?
 (11) A We did
 (12) Q What was the conclusion?
 (13) A That was the conclusion that we reached
 (14) Q I want to move to the Braer spill in Scotland Do you
 (15) recall about when that was?
 (16) A It was in the Shetlands
 (17) Q I shouldn't say Scotland because that's an issue
 (18) A Shetlanders wouldn't appreciate it
 (19) Q The Braer ran aground on the southern end of the Shetland
 (20) Islands about when do you recall?
 (21) A I can't recall the date of the spill It was about - I'm
 (22) sorry I can't bring it to mind It was a year or two years
 (23) ago
 (24) Q You and your colleagues were retained to go to the
 (25) Shetlands and study that spill?

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- (1) A Right
 (2) Q And particularly to study the impact of that spill on a
 (3) variety of different species of fish including salmon?
 (4) A Exactly
 (5) Q What did you find?
 (6) A I might say first that the salmon involved were not wild
 (7) salmon they were farmed salmon The Shetlands is a fairly
 (8) substantial producer of farmed Atlantic salmon The Shetland
 (9) closed down the farms that were oiled as a result of the spill
 (10) and the only farms that were still in operation were those that
 (11) were completely clear of the spill area And we checked the
 (12) prices that were received by those in the market which they
 (13) normally sell against benchmark prices in Scotland and in
 (14) Norway all of which produced farm Atlantics Norway in
 (15) considerable quantities and Scotland in considerable
 (16) quantities
 (17) And we noticed there was a substantial divergence between
 (18) the price that was paid after the spill for Shetlands fish in
 (19) comparison with Scottish and Norwegian fish although these
 (20) were clear of any possible taint at all
 (21) Q So the oiled farms were closed down and no fish came out
 (22) those?
 (23) A Right
 (24) Q And with regard to the fish that were still in the Shetland
 (25) Islands but were not oiled there was an adverse price effect?

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- (1) A There was
 (2) Q How long did that price effect go on?
 (3) A It s hard to tell precisely how long it went on because
 (4) there were other factors involved in altering prices at the
 (5) time but one thing did stand out Prior to the spill
 (6) Shetlands fish which had been promoted as coming from a
 very
 (7) pristine environment they were somewhat larger than the
 (8) Scottish and Norwegian fish They were branded and sold in
 the
 (9) market and they carried a premium typically for that period
 (10) when they were being marketed that way
 (11) After the spill the premium just about disappeared and up
 (12) until the present time Shetiands fish are sold pretty much in a
 (13) package with Norwegian Scottish and the others and that
 (14) constituted a fairly substantial blow to them
 (15) Q So up to the time of the spill Shetland fish got a premium
 (16) price and then from the date of the spill which I know it was
 (17) in 1991 - it was later than that?
 (18) A I think 92
 (19) Q From the date of the spill in 92 to the present day the
 (20) premium has gone?
 (21) A Has largely gone yes
 (22) Q Do you have an opinion as to whether that was as a result
 (23) of the spill?
 (24) A I can t say conclusively that it was a result of the
 (25) spill We felt strongly that that was the most logical

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- (1) explanation for a sudden change in a premium product to what
 (2) became just another product on the market
 (3) Q Now in the economic history of the Alaska salmon industry
 (4) there is something that has been historically referred to as
 (5) the botullism incident Are you aware of the so-called botulism
 (6) incident?
 (7) A Yes
 (8) Q Would you tell us about the botulism incident?
 (9) A Well somebody died from eating canned salmon in which
 (10) botulism occurred faulty canning I guess and I understand
 (11) that later on a second person died although it was not
 (12) conclusive that that was from canned salmon it was believed
 (13) to be so The effect of that was to put a real body blow into
 (14) the market of canned salmon and that lasted for a couple
 (15) years
 (16) Q And that salmon was sold in Europe?
 (17) A Yes uh huh
 (18) Q And the price impacts were on salmon from Alaska?
 (19) A Correct
 (20) THE COURT The distraction that everybody -
 (21) MR O NEILL That s my stomach
 (22) THE COURT No It s another naturalization
 (23) ceremony It s the Sweet Alldades singing next door It will
 (24) only go on for a few minutes
 (25) BY MR O NEILL

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- (1) Q Doctor is it okay if we wind our way around the music?
 (2) A Okay as long as my hearing aid holds up
 (3) Q I was thinking I had to excuse myself
 (4) You were asked to study whether or not the Exxon Valdez oil
 (5) spill had an impact on Upper Cook Inlet sockeye salmon
 (6) A Right
 (7) Q And would you describe for us how you structured that
 (8) study what were you going to look at with regard to that
 (9) study?
 (10) A Well first thing we wanted to look at was again the
 (11) general state of the market prior to the time the spill
 (12) actually occurred and paying particular attention to the time
 (13) when price negotiations got underway and they were beginning
 to
 (14) take form and that included a variety of things The
 (15) forecasts again for production the general state of the
 (16) economy in Japan trends in consumer consumption of salmon
 in
 (17) Japan in both of the major forms trends in retail and
 (18) wholesale prices in Japan
 (19) In addition we wanted to I shouldn t say substantiate
 (20) that but to go forward simultaneously with that a statistical
 (21) modeling exercise to see if we could determine from statistical
 (22) procedures whether or not our conclusions about the impact of
 (23) the spill from the general market conditions were correct
 (24) This was made a good deal easier than in many exercises of this
 (25) sort because we re talking about one product a couple of

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- (1) forms but really one product from one area 98 or 99 percent
 (2) of which is sold into one market But it becomes a much easier
 (3) exercise than the sort of thing when we re dealing with all
 (4) salmon in Alaska or salmon that are sold in many different
 (5) markets
 (6) Q Did you take a look at the consumer and wholesale markets
 (7) in Japan?
 (8) A Yes we did
 (9) Q And what did you find was the status of those markets prior
 (10) to the spill?
 (11) A The markets for some types of salmon have begun to slip in
 (12) late 1988 but sockeye salmon had not Sockeye salmon prices
 (13) at both wholesale and retail were actually increasing held up
 (14) very well during the first quarter of 1989 Retail prices
 (15) actually held through September of 1989 and really beyond that
 (16) time until 1993 Retail prices for sockeye salmon in Japan
 (17) have not gone below about five or six percent below the level
 (18) that they reached in 1989 There was a small dip in retail
 (19) prices after the spill but it s remained almost completely
 (20) stable for a year and a half since then
 (21) Q Was the market up to the time of the spill with regard to
 (22) sockeye UCI sockeye did it have a healthier rosier outlook?
 (23) A It did There were comments in the trade press that the
 (24) expectation for sockeye were strong for the coming back year
 (25) That was buttressed by the fact that the inventories of sockeye

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- (1) had declined for three previous years and in 19 - April of
 (2) 1989 they stood at about three quarters of what they had been
 (3) for the average of the preceding years
 (4) It was not a large inventory It was a smaller inventory
 (5) of sockeye which gave some grounds to the argument that the
 (6) market looked good
 (7) Q Did you help design with one of your colleagues and then
 (8) work in the implementation of a price model?
 (9) A Yes My role in it was primarily to ask the questions that
 (10) needed to be answered I am not a modeler myself but one
 (11) member of my firm is a very competent modeler and I wanted
 (12) to know some of the things from him we could do to improve on
 (13) the models that he looked at We looked at a number of them that
 (14) had been done but none of them really addressed the problem
 (15) we had None of them addressed a situation in which you had one
 (16) product from one area sold in one market
 (17) Q So you reviewed a number of salmon price modeling
 (18) markets?
 (19) A Right
 (20) Q And then you - and I think Mr Freeberg?
 (21) A Right
 (22) Q Designed a model you conceptually him mathematically?
 (23) A Correct
 (24) Q And would you tell us what the design of the model was?
 (25) A What we wanted to do in designing the model was to keep it
 as simple as possible The more variables you introduce into a

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- (1) mathematical approximation of a fish market the more chances
 (2) of error and particularly the necessity of the modeler
 (3) introducing his own ideas as to what influences the price of
 (4) the thing you re trying to explain
 (5) We felt with all the fish going to one market for
 (6) practical purposes that the market itself would integrate far
 (7) better than we could the factors that were bearing on the
 (8) determination of prices in the Japanese market and the derived
 (9) price that they would have to go to in the ex vessel market or
 (10) the fishermen market as a result of that
 (11) So our model was designed to depend heavily on the
 (12) integration process of the actual market in which Upper Cook
 (13) Inlet reds are sold These are the people who make a living
 (14) buying and selling red salmon These people know more than
 (15) we do about the factors that bearing on the determination of
 (16) prices in any given pack year
 (17) Q I m going to do a calendar
 (18) There we go I made it I put the months across the top
 (19) January February March April May June July August
 (20) September October November December Now the specific
 (21) market we re talking about is the Tokyo Central Wholesale
 (22) Market?
 (23) A Right
 (24) Q And they keep data for the Tokyo Central Wholesale Market
 (25) on a quarterly basis?

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- (1) A They do
 (2) Q With regard to this particular study there is a
 (3) coincidence that helps the study in that the oil spill happens
 (4) at the end of the first quarter That s a correct statement
 (5) isn t it?
 (6) A That s correct
 (7) Q Now would you generally - the ex vessel price - both the
 (8) wholesale price and the ex vessel price those negotiations
 (9) occur through this period in time with the price as you
 (10) previously testified that the fishermen get occurring sometime
 (11) in here?
 (12) A Yeah that s correct
 (13) Q Now using this wonderful calendar that I have constructed
 (14) if you could relate the model to the calendar
 (15) A Yes The period that - do I have something to draw with?
 (16) I think I can just discuss it
 (17) Q Just a second
 (18) A The first quarter of the year is the quarter in which the
 (19) first formation in buyers and sellers mind of what that price
 (20) is going to be negotiated at get underway By that time you
 (21) have forecasts of the Alaska runs some of them from the
 (22) Fisheries Research Institute the University of Washington
 (23) from Alaska Department of Fish & Game So you ve got a fair
 (24) idea of what the forecasts are going to look like on a supply
 (25) element that accounts for about 70 percent of the sockeye

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- (1) coming into the Japanese market This is also the last quarter
 (2) in which you have only the previous year s fish to deal with
 (3) By the time you get into the second quarter you get a
 (4) mixture of prices because people are trying to dump inventory
 (5) that they hadn t been able to sell in the previous year There
 (6) are likely to be some cats and dogs mixed in with that which
 (7) carry a confusing price and there is likely to be a trickle of
 (8) new fish coming in from high seas Not much but you got a
 (9) mixture of prices that don t really relate to what s going to
 (10) happen in the rest of the season for our acquisition fish
 (11) So we chose - before actually looking at the data we felt
 (12) that the first quarter of the year would be the quarter to pick
 (13) as the independent variable which would determine the price
 (14) paid for fishermen in the subsequent negotiating period
 (15) If you go any farther back of that you re too far back
 (16) into a period when they are still trying to inventory out the
 (17) previous year s pack If you go any farther forward you re
 (18) getting mixed up into a marketing situation which has a mixture
 (19) of confusing prices in it This we felt was the proper place
 (20) to start our modeling exercise and it turned out that this
 (21) gave us the best results
 (22) Q So I m going to simplify this and then we can move on and
 (23) talk about it We re going to take for every year that we
 (24) have it the Tokyo Central Wholesale Market price for the first
 (25) quarter and plot it?

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- (1) A Correct
- (2) Q And then we re going to take and plot what the fishermen in
- (3) Upper Cook Inlet get for reds and compare those two to see if
- (4) there is a relationship between the two?
- (5) A Correct
- (6) Q And in this case the Tokyo Central Wholesale Market data
- (7) would be collected essentially almost up to the time of the
- (8) spill?
- (9) A That s right
- (10) Q And if the spill in fact had an effect on the price you
- (11) ought to see that in the relationship between the predicted
- (12) price and the actual price after the spill?
- (13) A That s correct
- (14) Q Did I get it?
- (15) A Yes
- (16) Q What is before I blow it up Plaintiffs Exhibit 431 for
- (17) identification?
- (18) A If you could blow it up I could see it better
- (19) This is a plot of predicted versus actual or observed
- (20) prices for Upper Cook Inlet sockeye based on the use of the
- (21) first quarter Tokyo wholesale prices and if you ll notice the
- (22) very high degree -
- (23) Q We ll talk about it in detail and I ll blow it up in
- (24) detail but this is a result of the study done by conceptually
- (25) you and statistically Mr Freeberg

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- (1) MR O NEILL Offer 431
- (2) (Exhibit 431 offered)
- (3) MR LYNCH Just that page?
- (4) MR O NEILL Just this page
- (5) MR LYNCH No objection
- (6) THE COURT Plaintiffs 431 is admitted
- (7) (Exhibit 431 received)
- (8) BY MR O NEILL
- (9) Q Now let s get this up to where we can see it
- (10) And even before we talk about the correlation you ve got
- (11) to make some sense out of it for us if you could do that
- (12) A I m sorry?
- (13) Q Tell us what it is how it works this graph
- (14) A It s a plot of observed against predicted prices to see how
- (15) closely they fit a statistical description of that I ll give
- (16) you in a minute but it shows for all except three years 1983
- (17) 1984 - actually four 1987 - 1983 87 and particularly in
- (18) 89 these are the only three years in which you get
- (19) significant deviations of the predicted price from the observed
- (20) price
- (21) But notice 1983 was the fall of the botulism scare which
- (22) was still being felt and had quite an influence on the
- (23) industry 1987 was the Glacier Bay spill 1989 was the Exxon
- (24) Valdez spill and only in the Exxon Valdez spill did you get
- (25) such an extreme drop between the predicted and actual
- observed

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- (1) price
- (2) Q And that s this right here So what this chart does
- (3) beginning in 1976 and going through 1990 it plots the first
- (4) quarter Tokyo wholesale central price?
- (5) A With some adjustments
- (6) Q With some adjustments and tracks that against what the
- (7) fishermen get?
- (8) A That s correct
- (9) Q And the expectation is that for most of your years the
- (10) points will be essentially in the same place?
- (11) A Right And I must add to do that the random model only
- (12) through 1989 because by the time we get to 1990 the spill has
- (13) occurred the impact of the spill on the market will have taken
- (14) place and the model will capture both the effect of the spill
- (15) and any other market forces so that it s really valid only
- (16) through 1989
- (17) Q So using this particular approach all you can do is study
- (18) whether there was a price drop and that price drop only for
- (19) one year?
- (20) A That s correct
- (21) Q Because when you get to the first quarter of 1990 and you
- (22) take a look at the Tokyo wholesale market price the market is
- (23) taking into consideration the spill so the model takes the
- (24) spill into consideration?
- (25) A Exactly It simply answers itself

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- (1) Q So the model has a great deal of utilities for studying
- (2) 1989 but by its nature is incapable of studying 1990 or 1991
- (3) and the spill?
- (4) A That s correct What we wanted to see was whether or not
- (5) the model captured the normal market effects that people
- (6) trading in the Tokyo wholesale market would be looking at and
- (7) that this would influence the price they were willing to pay
- (8) for the next year s pack and it does this very closely
- (9) indeed
- (10) We were also interested to see I don t want to say
- (11) breakdowns but shows deviations where you have external
- (12) effects like the botulism and the oil spill the other one and
- (13) it shows that very clearly The coefficient of R squared
- (14) statistic is 96 1 which is very high for a model of this sort
- (15) Q Now I want to ask you a couple questions about the
- (16) exhibit The actual price of salmon beginning in 1984 in fact
- (17) through 1988 for Cook Inlet reds rose?
- (18) A Yes it was increasing steadily in that period
- (19) Q And then between 1988 and 1999 (sic) over the time of the
- (20) oil spill we get a precipitous drop?
- (21) A That s correct
- (22) Q Now let s put this one piece of information aside for the
- (23) time being and we ll come back to it Did you look at other
- (24) aspects of the market other than this model?
- (25) A Yes One of the things we looked at as I mentioned it

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- (1) was the inventory situation We kept hearing that inventories
 (2) were outlandishly high and in fact they weren't The
 (3) inventories for all salmon in Japan were ten or 12 percent
 (4) above the average for the previous three or four years which
 (5) is not high
 (6) The picture for inventories appears to be rising sharply
 (7) over a period running from about 1977 '78 on but this simply
 (8) reflects the fact that the Japanese were producing and
 (9) importing larger and larger amounts of salmon With higher
 (10) incomes and a very favorable exchange rate Japanese
 (11) consumption of salmon leaped ahead and if you have larger
 (12) consumption and home production obviously inventory figures
 (13) are going to be higher
 (14) Q I want to take a look at Exhibit 420 in evidence and ask
 (15) what you Plaintiffs Exhibit 425 is?
 (16) A This is an indication of Japanese holding of masu and
 (17) sockeye masu is pig and sockeye is not just sockeye it's
 (18) chinook sockeye coho and chum all others but pink These
 (19) are the figures we could find for Japanese figures These are
 (20) as of the end of 1988 first of 1989 You'll see that the
 (21) inventory in 1989 at this point is not out of line with
 (22) inventories running from 1983 '84 '85 '86 '87 '88 '88
 (23) was low and part of the increase in catch in 1989 went to
 (24) replace inventories that were significantly lower The
 (25) inventory for sockeye behaved rather indifferently

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- (1) MR LYNCH Your Honor excuse me On that subject
 (2) could Mr O'Neill give us a little more foundation on the basis
 (3) for the differentiation Dr Crutchfield has testified that
 (4) the only official figures group red salmon he's beginning to
 (5) talk about sockeye individually and I'd like to know what's
 (6) the source
 (7) BY MR O'NEILL
 (8) Q What's the source?
 (9) A It's from the Japanese Fishing Agency I can't give you the
 (10) precise definition of the source but it is an official
 (11) Japanese publication
 (12) MR LYNCH Are we talking about this exhibit?
 (13) BY MR O'NEILL
 (14) Q These -
 (15) A These are all salmon
 (16) Q This is all salmon?
 (17) A Right
 (18) Q Are we moving on now to talk about -
 (19) A Sockeye specifically
 (20) Q Now when talk about sockeye only is there a data source
 (21) for sockeye only?
 (22) A The only data source we had was a private source from Bill
 (23) Atkinson's report which is a summary from his contacts in the
 (24) trade usually regarded as quite accurate
 (25) Q And Bill Atkinson publishes a newsletter to traders out of

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- (1) Seattle where he published his data with regard to these
 (2) things?
 (3) A It's nearly comprehensive covers a lot of things and
 (4) salmon is covered quite thoroughly
 (5) Q And people in your business and indeed people in the trade
 (6) rely on what is called the Bill Atkinson newsletter?
 (7) A We do
 (8) Q Although it's now run by Bill Atkinson's son?
 (9) A It's a good accurate report of what he gleans from the
 (10) trade in Japan itself
 (11) Q What does the Atkinson newsletter tell you?
 (12) A That sockeye inventories were behaving rather
 (13) indifferently They declined in the period of 1986 '87 and
 (14) '89 and that '89 inventories as of April 1st were about 75
 (15) percent of what they had been in the previous four years so -
 (16) and the trade journals noted this The expectation of firm
 (17) prices for salmon sockeye salmon rested in part on the fact
 (18) that inventories were low
 (19) Q Now Exhibit 427 Plaintiffs 427 is in evidence Would
 (20) you tell us what Plaintiffs Exhibit 427 is?
 (21) A These are the estimates that we had from Bill Atkinson of
 (22) holds for three different types of salmon The brown are
 (23) sockeye salmon and as you can see from 1986 to '87 to '88 to
 (24) '89 the April 1st inventories were declining fairly
 (25) substantially They were only slightly higher than they were

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- (1) back in 1985 The blue figures are inventories of chum salmon
 (2) which is a partial substitute for sockeye that's the purple I
 (3) guess and the blue figures light blue figures are inventory
 (4) figures for coho or silver
 (5) Q Now we have this graph and my question to you is
 (6) relating that to what we're trying to study here why is this
 (7) important?
 (8) A It's important for two reasons One it emphasizes the
 (9) fact that there isn't any such thing as a market for salmon in
 (10) Japan the market in Japan is segmented and the factors that
 (11) bare on the price of sockeye are not the same factors that bare
 (12) with the same weight on prices of chum or silver and so on
 (13) Also I just wanted to emphasize the fact that although
 (14) inventories of all salmon taken together were only slightly
 (15) above the previous level sockeye inventories which is what
 (16) we're talking about were substantially down and had been
 (17) down
 (18) for several years that obviously does have an influence on the
 (19) market
 (20) Q What is Plaintiffs Exhibit 428 which is in evidence?
 (21) A This is an indication of exports from the United States to
 (22) the Japanese market in January February and March of 1989
 (23) three months of the first quarter of sockeye in the middle
 (24) here You'll notice that in January February and March
 (25) exports to Japan from the United States of sockeye rose
 (26) substantially There were also fairly substantial increases in

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- (1) the exports of chum during the same period and of coho during
 (2) the same period which is I think a fairly strong indication
 (3) of the fact that somebody in Japan and somebody in the United
 (4) States regarded the market in Japan as being in pretty good
 (5) shape at that point particularly for sockeye and were
 (6) exporting considerable amounts of fish
 (7) I mentioned this simply because it stresses the fact that
 (8) while the traders may have regarded some other species as
 (9) facing downward trends in prices they weren't looking at
 (10) sockeye that way They were importing
 (11) Q Now I placed up on the screen Plaintiffs Exhibit 429
 (12) which is in evidence Would you tell us what 429 is and how it
 (13) helps us in what we're looking at?
 (14) A This is the same quarterly period for 1989 and again
 (15) chum sockeye coho but these are the value of U S exports
 (16) I simply wanted to indicate that these weren't being exported
 (17) at fairly satisfactory prices but these were good prices going
 (18) from January February and March
 (19) Q So would it be fair to say that looking at these factors
 (20) and the other factors that you looked at in the weeks and
 (21) months linked up to the time of the spill the market looked
 (22) healthy?
 (23) A This coupled with the fact that retail prices in Japan
 (24) were very steady during this period showed no signs of any
 (25) collapse at all they were holding firm and large quantities

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- (1) of salmon were being sold at retail
 (2) Q Let's talk a little bit if we could about monthly retail
 (3) prices of sockeye salmon in 15 Japanese cities from 1988 to
 (4) 1989 Did you gather that information?
 (5) A Yes That came from an official Japanese publication which
 (6) is published every year
 (7) Q Before we talk about the exhibit I need to get it into
 (8) evidence so we need to -
 (9) A Sorry
 (10) Q Is Exhibit 420 this compilation from official Japanese
 (11) sources about the data that we're talking about?
 (12) A Yes
 (13) Q Is it helpful to you in explaining impact or potential
 (14) impact of the spill on sockeye salmon prices in Cook Inlet?
 (15) MR O NEILL Offer Exhibit 420
 (16) (Exhibit 420 offered)
 (17) THE COURT Does the TV set have an objection?
 (18) MR LYNCH I wonder if we could let that stand rather
 (19) than do voir dire on it I have the same problem I'm not
 (20) quite sure of the sources
 (21) BY MR O NEILL
 (22) Q What are the sources?
 (23) A I'm sorry I have that in the report that we furnished you
 (24) and which they have as well
 (25) Q Is it from official Japanese reporting sources?

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- (1) A That's correct we didn't dream this up
 (2) Q And in the detailed report that you provided to me and the
 (3) Exxon people you detailed what the official sources were?
 (4) A Precisely
 (5) MR O NEILL I offer 420
 (6) THE COURT Does this solve the problem Mr Lynch?
 (7) MR LYNCH Your Honor I'll withdraw the objection
 (8) but I'd like to reserve a motion to strike
 (9) THE COURT Very well Exhibit 420 is admitted at
 (10) this time
 (11) (Exhibit 420 received)
 (12) BY MR O NEILL
 (13) Q What is Exhibit 420? Would you tell us how it aids to our
 (14) inquiry here?
 (15) A Yes Before I do let me make a correction if I can
 (16) The way this graph is drawn it starts from 2300 yen per
 (17) kilo and goes up to 3 000 yen per kilo which gives you a
 (18) misleading affect of how fast prices went up and down If you
 (19) run that graph down to zero at the base you can see that the
 (20) changes are really much smaller
 (21) What it shows is that from January through July price
 (22) changes at the retail level were very small indeed in the
 (23) vicinity of 5 percent Even the maximum price drop that
 (24) occurred was less than 10 percent after the spill Thereafter
 (25) although I don't have a graph because I didn't intend to

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- (1) present it in evidence my own curiosity got the better of me
 (2) and I asked myself what happened to retail prices thereafter
 (3) And the answers is they remained almost stable through the
 (4) next couple of years through the middle of 1993
 (5) In Japan there is no evidence then - and this is the
 (6) point we wanted to drive home There is certainly no evidence
 (7) that the Japanese market for sockeye salmon was collapsing
 (8) prior to the time of the spill It was healthy and it remained
 (9) healthy thereafter
 (10) Q Did you take a look at the average monthly price of local
 (11) sockeye salmon in the Tokyo wholesale market?
 (12) A Yes we did
 (13) Q And that is Exhibit 419 for identification?
 (14) A Right
 (15) Q And Exhibit 419 for identification is data that you and
 (16) people at NRC took from prices of the Tokyo Central Wholesale
 (17) Market?
 (18) A That's correct
 (19) Q Is it helpful to you to explain what happened to the price
 (20) of reds from the Exxon Valdez oil spill?
 (21) A It is
 (22) MR O NEILL I offer 419
 (23) (Exhibit 419 offered)
 (24) THE COURT Is there an objection to 419?
 (25) MR LYNCH Your Honor my understanding of the

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- (1) foundation is that it involves more than simply I picked up
 (2) this data somewhere I would like to ask the question at
 (3) least to identify the source of the data
 (4) THE WITNESS The Tokyo Central Wholesale Market
 (5) publishes these figures monthly and they were taken directly
 (6) from those data
 (7) BY MR O NEILL
 (8) Q Just like the stock market publishes monthly?
 (9) MR O NEILL Renew the offer
 (10) MR LYNCH No objection
 (11) THE COURT Thank you Exhibit 419 is admitted
 (12) (Exhibit 419 received)
 (13) BY MR O NEILL
 (14) Q Now I want you to explain to us Exhibit 419 and how it aids
 (15) in our investigation here
 (16) A Two points I wanted to emphasize One is the fact that
 (17) again through the first quarter of 1989 wholesale prices
 (18) continued to drift upward That I think is the reason why we
 (19) saw the imports of sockeye coming in from the United States
 (20) Both exports in the states and Japanese foresaw a pretty strong
 (21) market otherwise they wouldn't have been seeing this kind of
 (22) price but the price falls out
 (23) The price falls down sharply after the new pack of fish
 (24) begins to be in evidence These are previous years fish
 (25) Japanese traders Japanese retailers Japanese consumers

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- (1) generally are aware of the fact that these were fish taken
 (2) prior to the spill After the fish come in subsequent to the
 (3) spill then the wholesale price begins to crumble
 (4) Q As a result of the model that you and Mr Freeberg worked
 (5) on the various market factors that you looked at including
 (6) the ones that we talked about here today - and they weren't
 (7) the only ones that you looked at were they?
 (8) A No
 (9) Q In your experience your knowledge your study of the Braer
 (10) spill your study of the Glacier Bay spill your 40 to 50 years
 (11) as an economist - you shouldn't wince when I say that because
 (12) it happens to all of us
 (13) A Yeah
 (14) Q Have you formed an opinion sir as to whether the 1989
 (15) Exxon Valdez oil spill had an impact one way or another on the
 (16) price paid to fishermen?
 (17) A I have I think it did have such an effect
 (18) Q And what was the effect?
 (19) A The effect was to lower prices paid to fishermen in
 (20) response to a situation which the traders viewed with real
 (21) alarm and uncertainty and which gave them the incentive to use
 (22) the spill as a very strong bargaining weapon in negotiating
 (23) prices for the coming years pack This was an ideal weapon to
 (24) use to get the price down Fishermen had no other place to go
 (25) with their fish and the spill had a very strong influence on

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- (1) the bargaining process exactly as it had in the Braer case and
 (2) others
 (3) Q Now I want to have you perform one other task for us while
 (4) you're here if you would and that is we have introduced
 (5) portions of Exhibits 3652 into evidence through other witnesses
 (6) and we haven't introduced this value column And I'm going to
 (7) ask you did you at NRC put together the prices that pinks were
 (8) sold at from 1984 through 1991 and are those reflected in the
 (9) column on the Exhibit 3652?
 (10) A I didn't put them together but NRC staff did
 (11) Q Did you assure they were the correct values and numbers
 (12) and
 (13) question them about the sources?
 (14) A Yes These are ADF&G or CFEC prices
 (15) Q These are not projections these are the actual prices
 (16) paid taken from the Commercial Fisheries Entry Commission
 (17) and
 (18) ADF&G data?
 (19) A Correct
 (20) Q And with regard to the calculation I asked you to give me
 (21) a conservative number using this historical data the most
 (22) conservative number using this historical data we could get in
 (23) order to do a price projection for 1994 and 1995 isn't that
 (24) correct?
 (25) A That's correct
 (26) Q And you told me that the most historical - the most
 (27) conservative number to take in order to do the price projection

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- (1) would be to take the lowest number?
 (2) A I did
 (3) Q And we did that and is that a legitimate means as we sit
 (4) here not in fact knowing what prices are going to be for 1994
 (5) and 1995 with regard to projecting a price?
 (6) A Yes Without going through any kind of long formal
 (7) analysis we really have no other option The lowest price in
 (8) the last five years is certainly an extremely conservative
 (9) price
 (10) Q Thank you And with regard to Exhibit 3653 we did the
 (11) same thing with regard to that exhibit that is go get the
 (12) actual price data and again take the most conservative number
 (13) we could the lowest number from the last five years not
 (14) counting the spill year and apply that to the calculation?
 (15) A Correct That is a very conservative number to say the
 (16) least
 (17) Q And the same thing with Plaintiffs 3820 which are reds in
 (18) Kodiak went through the same drill came up with the same
 (19) conservative estimate?
 (20) A That's correct
 (21) MR O NEILL And I would now on the basis of all of
 (22) the testimony on these three exhibits offer - Exhibits 3652
 (23) 3653 and 3820 are offered
 (24) (Exhibits 3652 3653 and 3820 offered)
 (25) MR LYNCH No objection Your Honor

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- (1) THE COURT Thank you Those exhibits are admitted
 (2) (Exhibits 3652 3653 and 3820 received)
 (3) MR O NEILL Dr Crutchfield thank you for the help
 (4) you ve given us and I m now going to turn you over for the
 (5) remainder of this fine Friday afternoon to Mr Lynch
 (6) MR LYNCH Is that a favor or not?
 (7) CROSS EXAMINATION OF JAMES CRUTCHFIELD
 (8) BY MR LYNCH
 (9) Q Doctor one personal question before we start Can I
 (10) assume that the great fisheries of Ireland are going to be
 (11) better off now that the Shetlands don t have a premium?
 (12) A I don t know I haven t been over there I only watch the
 (13) football score now
 (14) Q Well I sure hope so
 (15) I ve handed you a book there Doctor in which I ve put the
 (16) exhibits that I expect to be using in hopes that that could
 (17) speed things up I d like if I could to just refer you to
 (18) Exhibit DX2047
 (19) A Right
 (20) Q Is that the Bill Atkinson news report to which you made
 (21) reference in your direct testimony?
 (22) A Yes that is
 (23) Q And that s the source which you used in part to get your -
 (24) it was from his publication that you got your sockeye inventory
 (25) numbers?

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- (1) A One source The other source was the official Japanese
 (2) figures This was the source for the April 1st figures that s
 (3) right and the only figure we had for sockeye only
 (4) Q For sockeye because the Japanese figures have two
 (5) categories one is pink and one is called red but it means all
 (6) others is that correct?
 (7) A That s correct
 (8) Q Now I wonder if you would turn with me to the first - I m
 (9) sorry to the October 26th 1988 - if you d like you can
 (10) follow it on the screen with me As of October 1988 it s
 (11) correct that Mr Atkinson was indicating that sales were
 (12) dropping this is before the first quarter of 1989 isn t that
 (13) correct?
 (14) A Yes uh huh
 (15) Q And that the supply of hikato (ph) fall chum were
 (16) exceeding - were coming in at record levels?
 (17) A Correct
 (18) Q Now that was a result of a situation that had existed for
 (19) a couple years prior to that time is it not?
 (20) A Not with respect to sockeye no the sockeye inventories
 (21) were low during that period
 (22) Q Correct In 1987 and 1988 overall salmon supply had been
 (23) down in Japan is that correct?
 (24) A Yes
 (25) Q And overall Alaska salmon exports to Japan had been down?

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- (1) A I m sorry I didn t catch that
 (2) Q Overall salmon exports to Japan from Alaska sockeye as
 (3) well as other species had been down?
 (4) A Yes
 (5) Q And that s because the Alaska catch had been down?
 (6) A Yes
 (7) Q And prices had reached a record high?
 (8) A No 1988
 (9) Q That was the all time high priced realized for salmon is
 (10) that correct?
 (11) A That s correct
 (12) Q Now you mentioned in direct that one of the things that
 (13) occurred during this period of time pre 1989 was that the
 (14) exchange rate had been changing is that correct?
 (15) A Yes it had
 (16) Q And the effect of that change was was it not that a yen
 (17) the Japanese yen would translate into a larger number of
 (18) American pennies or nickels or quarters whatever the closest
 (19) denomination would be?
 (20) A That s correct although it was not a uniformed decline
 (21) There was a flat period if my memory serves me about 1984
 (22) through 89 when the yen depreciated slightly against the
 (23) dollar not very much and then the yen appreciated again
 (24) thereafter I can t remember the exact figures but that s
 (25) roughly the way it was

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- (1) Q Is it correct according to your general recollection Dr
 (2) Crutchfield that net - taking the whole period of time that
 (3) the buying power - that the translation of increases in prices
 (4) for salmon in Japan was about a 20 percent increase but
 (5) because of the exchange rate it represented about an 50
 (6) percent increase for U S recipients?
 (7) A Yes
 (8) Q So that the 1988 prices didn t cost the Japanese as much as
 (9) it benefited the people who were receiving it in the United
 (10) States?
 (11) A No When the yen appreciates obviously the Japanese get
 (12) imports at lower prices in terms of their own currency
 (13) Q I d like to direct your attention to the sort of last
 (14) sentence of this second paragraph of the October report
 (15) A Uh huh
 (16) Q That indicates that according to Mr Atkinson - and Mr
 (17) Atkinson is reporting what he read in the Japanese trade press?
 (18) A Correct
 (19) Q That although there is an unusual or record supply becoming
 (20) available the market is not expecting that processors will be
 (21) dumping their inventory into the market?
 (22) A I haven t read it
 (23) Q Could you read just that last sentence which I ve
 (24) highlighted?
 (25) A Is it on page 2?

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- (1) Q No It s on the second paragraph of the first page
 (2) According to market sources however -
 (3) A Yes I see that
 (4) Q And you would infer from what you know about the Atkinson
 (5) report that that s not Atkinson expressing his opinion but
 (6) Atkinson reporting what people in Japan were saying traders?
 (7) A What he heard
 (8) Q And what he read in the Japanese trade publications?
 (9) A Right
 (10) Q If I could just switch for a second the Atkinson report is
 (11) a summary of articles from the Nikensuson (ph) I leave it to
 (12) the - you and the jury to read those words but those are
 (13) Japanese trade papers sir?
 (14) A I believe they are yes
 (15) Q And what Mr Atkinson does is follow those papers and
 (16) report them to American participants in the fishing industry?
 (17) A He does more than follow papers He is quite close to the
 (18) Japanese trading community and he has contacts He has a
 (19) pipeline into what s going on over there
 (20) Q And he s reporting that although the supply is growing
 (21) greater than expectation traders will be able to hold onto
 (22) their inventones until June or July ever 1989?
 (23) A That they don t have to dump them in a panic
 (24) Q And dump them in a panic means get rid of them at a low
 (25) price sell them maybe at a loss?

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- (1) A That s correct
 (2) Q And those inventories that you were talking about with Mr
 (3) O Neill - could I borrow that for a second?
 (4) MR O NEILL Yeah
 (5) BY MR LYNCH
 (6) Q You remember Mr O Neill had a chart up on the screen and
 (7) he talked about filling in inventories He asked you if the
 (8) 1989 -
 (9) A I m sorry I don t know what you re referring to
 (10) Q When you were talking with Mr O Neill you had a chart
 (11) that showed the state of the inventories in 1988 and in 1989
 (12) and there was kind of a trough there and Mr O Neill or maybe
 (13) you drew it a line across talked about filling up the
 (14) inventories?
 (15) A No What I was referring to there was simply - I was
 (16) drawing a line to show roughly the average for the years in
 (17) question and that the inventory picture in 1989 was only
 (18) slightly above the average There are always fluctuations from
 (19) year to year
 (20) Q But we need to understand that this inventory is basically
 (21) a year long product?
 (22) A That s correct
 (23) Q The trader who buys at the end of the fishing season or
 (24) during the fishing season can basically think about holding
 (25) this frozen salmon for about a year and meeting it out is that

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- (1) correct?
 (2) A He better not hold it for a year He will sell it at a
 (3) price which he feels will yield him the largest net return and
 (4) he will reduce that inventory over the course of the pack year
 (5) hoping he will come out with the last quarter to meet his terms
 (6) and needs
 (7) Q And optimize his return on the investment in the prior
 (8) year?
 (9) A That s correct
 (10) Q And I think you also said if I understood you correctly
 (11) that it s your understanding and belief that the majority of
 (12) the U S processors who buy the salmon from the fishermen
 (13) it head it and freeze it they are affiliated with someone on
 (14) the Japanese side of the market transaction?
 (15) A In some way yes because the - again the nature of the
 (16) relationship varies Some of them are virtually directly
 (17) owned some of them have a substantial equity share in the
 (18) American firm some of them are loaned money to carry
 (19) inventory and so on and carry initial expenses There are
 (20) very few wholesale operations in Alaska dealing with fish that
 (21) do not have Japanese financial support of some kind or
 (22) another
 (23) Q Is it the case that some of these processors hold the
 (24) frozen fish in the United States and meter it out either to
 (25) Japan or other market opportunities as the year goes by?
 (26) A Some is held here but the majority is not

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- (1) Q When you talk about U S Imports in January February and
 (2) March of 1989 -
 (3) A U S exports
 (4) Q U S exports I m sorry Now you know why I didn t do too
 (5) well in economics
 (6) U S exports in January February and March of 1989 those
 (7) would be frozen sockeye?
 (8) A That s correct
 (9) Q And those would have been put in inventory from the prior
 (10) year?
 (11) A Right
 (12) Q And quite possibly would have been owned all along but at
 (13) least in part by some Japanese marketing factor?
 (14) A May well have been yes sir
 (15) Q Now with reference to your - the studies that you had
 (16) previously done of the effect of incidents on the price of
 (17) salmon you indicated the botulism scare or problem that
 (18) occurred in 1983?
 (19) A 82 I believe end of 81 or 82
 (20) Q But you assigned it to the 83 price year on your chart Is
 (21) that correct?
 (22) A Yeah
 (23) Q And did that involve sockeye salmon or pink salmon?
 (24) A I don t recall I m not sure
 (25) Q That involved a situation where someone in Europe actually

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- (1) received a tainted product?
 (2) A And ate it
 (3) Q Ate it Became ill and died?
 (4) A Right
 (5) Q And as a consequence of that is it not the case that
 (6) several countries in western Europe excluded any further
 (7) shipments of Alaskan canned salmon?
 (8) A That s correct
 (9) Q Pink as well sockeye is that correct?
 (10) A Right
 (11) Q And that was a highly publicized event that led to an
 (12) exclusion of the product from the market is that correct?
 (13) A Yes
 (14) Q Now in the case of the Glacier Bay situation that you
 (15) looked at that was a case where - by the way that was a
 (16) spill from a ship owned by somebody called Trinidad?
 (17) A I m - trying to determine who owned that ship was beyond
 (18) my capabilities
 (19) Q There was difficulty with that
 (20) THE COURT We had trouble with that
 (21) BY MR LYNCH
 (22) Q And that involved a partial closure for several days is
 (23) that correct?
 (24) A Well it was a series of intermittent closures throughout
 (25) most of the season until the very end because Alaska
 Department

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- (1) of Fish & Game was trying as best it could to allow fishermen
 (2) to get out and harvest fish as long as there was no danger of
 (3) them getting into oiled fish and there were spot openings and
 (4) they were very disrupted and the harvest was significantly
 (5) smaller than it would have been had there not been a spill
 (6) Q In that case as I understood your dialogue with Mr
 (7) O Neill one of the things you did was to look at the prices
 (8) that fishermen in Upper Cook Inlet were receiving?
 (9) A Uh huh
 (10) Q And to look for changes that occurred in those prices
 (11) within the season?
 (12) A That s rght uh huh
 (13) Q And part of what you looked for was the price that was
 (14) being paid to fishermen in Bristol Bay and Copper River and
 (15) other places?
 (16) A Yes
 (17) Q And you saw differentials?
 (18) A There is always a differential between Bristol Bay and what
 (19) they call local sockeye sources which are all of the others
 (20) Bristol Bay typically gets a lower price Most of the other
 (21) locals will pretty much hang together with the exception of
 (22) some Copper River fish which carry a premium but these tend
 (23) to be reasonably stable over time
 (24) Q And in this instance you found there was a differentiation
 (25) and part of your conclusion was based on the fact that traders

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- (1) were differentiating Upper Cook Inlet fish from other fish
 (2) caught in Alaska?
 (3) A It was more than just looking at that There was a long
 (4) record of conversations between Japanese buyers and
 American
 (5) processors American processors and fishermen and so on to
 the
 (6) effect that heavy pressure was being brought on the American
 (7) processor to cut the price to fishermen that they couldn t
 (8) stand the risk of getting oiled fish in or even the threat of
 (9) getting oiled fish in so there was a very substantial record
 (10) of conversations facts pressure of that sort
 (11) Q But was the premise of my question correct? In addition to
 (12) those things that you ve mentioned was there also evidence
 (13) that you relied on that traders were offering a different price
 (14) to Upper Cook Inlet fishermen than they were offering to
 (15) fisherman in areas that were not affected by the Glacier Bay
 (16) spill?
 (17) A There were differences and the price was cut very
 (18) substantially at a time when normally the progression is for a
 (19) slight upward adjustment in prices as the season goes along if
 (20) it looks like a good market year which it did
 (21) Q But you ve answered my question you noticed differences?
 (22) A Yeah
 (23) Q And in the case of the Shetlands when you looked at it
 (24) you saw there was a differentiation of the price paid to Norway
 (25) and to Scotland as opposed to the Shetlands as a result of what

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- (1) you attributed or thought to be probably resulting from the
 (2) spill?
 (3) A That s correct
 (4) Q Now staying with Exhibit DX2047 I d like to ask you next
 (5) to look at the report for November 1988
 (6) A Right
 (7) Q Do you see the entry that says salmon market?
 (8) A The first page?
 (9) Q Yes sir It s the - may I approach Your Honor?
 (10) November 23rd I should have given you the day as well
 (11) You see that in November Mr Atkinson reported that his
 (12) Japanese sources including these trade papers indicated that
 (13) the market for frozen salmon is softening due to the good
 (14) catches of fall chum salmon and the general abundance of
 salmon
 (15) this year inventories of Cook Inlet sockeye are larger than
 (16) product from other fishermen?
 (17) A Yes I see that
 (18) Q Now the situation that you ve described in your direct
 (19) testimony in which someone has taken the risk in 1988
 someone
 (20) took the risk at very high prices correct and they were
 (21) holding and metering out inventory of sockeye and other
 (22) metering?
 (23) A Yes
 (24) Q Chum salmon is sort of the native salmon of Japan is that
 (25) correct?

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- (1) A It s a native salmon of a lot of places
 (2) Q But in Japan the sockeye is not native correct?
 (3) A The Japanese high seas fleet has brought in - no it s not
 (4) a native species in that sense
 (5) Q If the - the Japanese market began importing salmon fairly
 (6) recently is that correct?
 (7) A No not really It began importing salmon in the mid 70s
 (8) Q Well I guess it depends on how old you feel
 (9) A Japan became a fish importing country early in the 70s
 (10) It had been an exporter prior to that time but population and
 (11) income rises made it an importing country and that was true of
 (12) salmon as well as other things
 (13) Q With reference to the years before it was an importing
 (14) country the salmon was a traditional natural part of the
 (15) Japanese diet is that correct?
 (16) A That s correct
 (17) Q And the domestically supplied salmon was predominantly
 (18) chum
 (19) salmon?
 (20) A Correct
 (21) Q And am I right Doctor that in Japan the salmon - the
 (22) bulk of the salmon that s used in the household is eaten for
 (23) breakfast and lunch? What we would call breakfast and lunch
 (24) A I couldn t answer that directly I don t know It depends
 (25) on the species of salmon that you re talking about
 Q Well what about sockeye?

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- (1) A I can t answer that
 (2) Q Is it your understanding that it s more often than not
 (3) salted?
 (4) A It has been more often salted although that has been
 (5) changing in the last four or five years The proportion sold
 (6) in the household salted compared to fresh and frozen has
 (7) been
 (8) lowering somewhat along with some very general changes in
 (9) the
 (10) Japanese diet The Japanese have been shifting particularly
 (11) younger Japanese from reliance on fish to much more of a
 (12) western market but at the same time they have been shifting
 (13) their demand for fish from lower to higher priced fish items
 (14) so the demand for sockeye has been quite strong so it s
 (15) considered a desirable item
 (16) Q At least the bulk of the sockeye that s sold in Japan today
 (17) reaches the consumer salted?
 (18) A Bulk is a strong term but more of it does yes
 (19) Q More than half of it is sold that way?
 (20) A Yes
 (21) Q And is sliced and eaten in Japanese preparation?
 (22) A Yeah
 (23) Q As opposed to grilled if someone from here if they went
 (24) to Simon & Seafort s or Marx Brothers wherever Mr Jamin
 (25) mentioned?
 A They are not that quite separate because a lot of the
 salted salmon that you see on the market is converted from

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- (1) fresh to frozen fish held in inventory so they can go either
 (2) way depending on where the market goes
 (3) Q I understand that that s the holder of the inventory but
 (4) the end user in Japan often eats the fish in a way that we in
 (5) the United States are not very accustomed to using?
 (6) A I can t answer directly no
 (7) Q Salmon is a basic staple of the Japanese daily food
 (8) pattern isn t that true?
 (9) A No There are pronounced seasonal variations of salmon
 (10) around the holiday season around the end of the year I don t
 (11) think it s consumed evenly throughout the year That may be
 (12) true of pinks that s prepared but sockeye have very
 (13) pronounced
 (14) seasonal variations
 (15) Q Is it your opinion that sockeye salmon is not a staple of
 (16) the Japanese diet the sockeye salmon that s sold by Alaskans
 (17) to the Tokyo central market does more than half it go as a
 (18) staple?
 (19) A It is a traditional staple food Whether you would call it
 (20) a staple of the Japanese diet at the prices of sockeye - it s
 (21) not available to lower income Japanese It s not a staple in
 (22) that sense
 (23) Q Now if you would - sir could you turn with me to the -
 (24) I m looking for the June 7th issue of the Atkinson news
 (25) report This is also a part of DX2047
 A Just a second let me look here

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- (1) Q And you see that on June 7th Mr Atkinson reports that the
 (2) salmon market in Japan seems to have fallen apart over the
 (3) past
 (4) two months Now on June 7th he would be referring to May
 (5) and
 (6) April of 1989 Is that correct?
 (7) A That s correct
 (8) Q Buyers imported a considerable volume of product during
 (9) March and early April You pointed that out didn t you?
 (10) A Yes
 (11) Q Because of potential delays in the Japanese/Soviet salmon
 (12) negotiations and limited supply free and uncommitted
 (13) inventory
 (14) that seemed to be available unfortunately for the Importers
 (15) the salmon negotiations were settled quickly and a steady
 (16) supply of toki high sea chum began to appear In addition now
 (17) your model would not have taken a count of any of those
 (18) changes
 (19) that occurred in the two months preceding June 7 1989 isn t
 (20) that correct sir?
 (21) A It would have taken a count of March not April May and
 (22) June
 (23) Q And two months without the benefit of Mr O Neill s
 (24) hand drawn calendar April and May?
 (25) A That s correct
 Q Now in terms of the -
 A May I just make a quick correction? When you read that
 sentence buyers import a considerable amount of product
 during
 March and early April this paper comes out usually reporting

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- (1) information that s a month or two old
 (2) Q But you don t doubt that he s correctly identifying the
 (3) purchases as March and early April?
 (4) A That s right
 (5) Q And those buyers were taking a risk just as you described
 (6) with Mr O Neill correct?
 (7) A Correct uh huh
 (8) Q And they were betting on the belief according to the best
 (9) information that Mr Atkinson could get that there were going
 (10) to be some delays in the Japanese/Soviet salmon negotiations
 (11) correct?
 (12) A Yes
 (13) Q And they -- so they stocked up on salmon imported that
 (14) frozen salmon that you were talking about because they
 (15) thought
 (16) that the market was going to need that due to the foreseen
 (17) delay and the right of the Japanese to fish in Soviet waters
 (18) isn t that correct sir?
 (19) A The amount involved is very small compared to the total
 (20) Japanese market for salmon The high seas combination for
 (21) Japanese salmon production is relatively small
 (22) Q So you think Mr Atkinson is mistaken in his conclusion
 (23) that the market had fallen apart over the past two months?
 (24) A Well the market changes in fresh and frozen fish as it
 (25) does in fresh and frozen produce almost from day to day as
 (26) events occur not all of which could have been foreseen

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- (1) The point you were making is almost the same as the point I
 (2) was making earlier and that is when you get beyond the first
 (3) quarter the market contains some elements of sockeye that it
 (4) wouldn t have had you get a lot of strange things coming on
 (5) And you re making the point that I was and you can t see that
 (6) and prices tend to be hard to predict
 (7) What we did was take over a 14 year period the January
 (8) February March Tokyo wholesale prices and used those as a
 (9) benchmark indicator of what the trader would have been
 (10) thinking
 (11) about at that time when he starts formulating his idea about
 (12) price Now sure those are going to change it can t be
 (13) static
 (14) Q For example based on your own prior work you would have
 (15) believed that if an oil spill occurred in April or May and not
 (16) on March 24th that that would certainly show up in the market
 (17) wouldn t you?
 (18) A I m sorry?
 (19) Q Based on your earlier analytical work you re earlier and
 (20) later analytical work you d be of the belief that if an oil
 (21) spill affected a fishery in April or May or June of a year
 (22) that that change would be something that the market would
 (23) take
 (24) into account correct?
 (25) A It certainly would
 (26) Q And it would send prices down?
 (27) A It would

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- (1) Q In fact you drew the conclusion that that would happen
 (2) almost instantaneously? Didn t you say that your finding was
 (3) that traders quickly reacted --
 (4) A Well it depends on when the spill occurs If the spill
 (5) occurs several months before there are any new fish coming
 (6) into
 (7) the market obviously it isn t going to have that much of an
 (8) effect It isn t until you get the new pack that might have
 (9) been affected by the spill that you begin to get worried and
 (10) that s the pack that the wholesalers are going to be stocking
 (11) up on at the lowest possible price they can get That s when
 (12) it s going to show
 (13) Q Wholesalers will always stock up at the least possible
 (14) price?
 (15) A I think so
 (16) Q There is nothing unusual about the wholesaler trying to get
 (17) the lowest price?
 (18) A But there is something about the trader buying a product
 (19) which has to be produced in a very short period of time which
 (20) virtually has no other market where the fishermen cannot
 (21) afford to hold it frozen for them It s got to go That gives
 (22) him a positioning in bargaining that s rare in most
 (23) commodities
 (24) Q Well It s true in all agricultural commodities?
 (25) A Not all Some are storable
 (26) Q All perishable?

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- (1) A Not all perishables either because those in many cases
 (2) are handled at least in this country on negotiated marketing
 (3) agreements something the fishermen are not permitted to have
 (4) in Alaska
 (5) Q Now do you see the last sentence of the first paragraph of
 (6) Mr Atkinson s report of June 7th as a result the market for
 (7) almost all species of salmon have declined that s his
 (8) grammatical error declined drastically over the past few
 (9) months is that correct sir?
 (10) A Bill has a habit of using words that are dramatic The
 (11) prices have fallen no question about it
 (12) Q And he goes on to say in the next paragraph speaking of
 (13) toki or high sea chum salmon that even though the price is
 (14) quoted at a certain level if you really want to sell it
 (15) you ll have to sell it as a lower price is that true?
 (16) A I really can t comment other than the fact that in any
 (17) perishable product fish produce or anything else if I call
 (18) you up the price is different than if you call me up And I
 (19) think this is the situation that probably prevailed There was
 (20) some uncertainty as to what was going to happen in the market
 (21) Anybody who was anxious to sell fish was going to take a
 (22) discount on it
 (23) Q What he s saying the price has now dropped to 3 18 down
 (24) from 4 77 but if you really want to sell it you ll probably
 (25) have to let it go at 2 86?

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- (1) A Correct
- (2) Q Even though there are inventories of that type of fish?
- (3) A That s not true this is toki chum and inventories of chum
- (4) were not low at the time
- (5) Q You think he s wrong in this statement that there are
- (6) relatively low inventories or you think he s referring to
- (7) sockeye inventories?
- (8) A There may have been relatively low inventories of that
- (9) particular group of chum salmon product but chum inventories
- (10) as a whole were in fairly good shape
- (11) Q Now chum salmon are used in these traditional Japanese
- (12) meals salted are they not?
- (13) A Some of them yes
- (14) Q They are - from the standpoint of those of us who once in
- (15) a while read the recipe book they are a product that can be
- (16) used in lieu of sockeye for those particular recipes?
- (17) A That s again a pretty general statement There are
- (18) different qualities of chum significantly different The
- (19) higher qualities of chum are as you imply substitutes for
- (20) sockeye in the traditional uses Lower prices chums I think go
- (21) into rather different usages
- (22) Q Now Dr Crutchfield broadly as an economist and drawing
- (23) on the 50 years of economics experience there is a word that
- (24) Mr Sanders will probably want to begin using cross
- (25) elasticity?

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- (1) A Yes
- (2) Q What does that mean? Does that mean you cross your
- (3) suspenders?
- (4) A One of our buzz words It s a word that says what is the
- (5) response in quantity taken of product A if the price of product
- (6) B changes Cross elasticity refers to the sensitivity for the
- (7) demand of one product to changes in the price and availability
- (8) in another product
- (9) Q So if I have Rice Krispies here and Special K in boxes
- (10) right beside it and I increase the price of Rice Krispies by
- (11) 50 cents how much more Special K is going to be sold?
- (12) A I would have to do a price analysis but it would have a
- (13) very high degree because they are close All it does is
- (14) measure the degree of substitutability
- (15) Q From an economic standpoint it is an economic
- (16) impossibility is it not broadly speaking I know you re going
- (17) to find me an exception but broadly speaking as the price of
- (18) a substitute falls either demand will shift to that substitute
- (19) or the price of the other product must follow it down isn t
- (20) that true?
- (21) A It s true if you assume a completely static state of demand
- (22) for that group of products as a whole It could also be
- (23) possible if demand was going up for the product group as a
- (24) whole that changes in relative prices could occur but both
- (25) could show either increases or decreases in price But

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- (1) generally you re quite correct there is generally people more
- (2) willing to substitute cheaper for a more expensive if the
- (3) product is a staple
- (4) Q And cetrus peribus (ph) if the price of toki chum falls
- (5) either the demand for sockeye - some people will shift from
- (6) buying sockeye to buying chum or if there have been pressur
- (7) to reduce the price of sockeye salmon isn t that true?
- (8) A Well that depends on your assumption as to the degree of
- (9) cross elasticity To the extent that sockeye is regarded as a
- (10) different product certainly is marketed as a separate product
- (11) and identified as a separate product from chum then yes it
- (12) may be blunted and you may not get an effect at all
- (13) in the event that the price is the same of low quality
- (14) chum you may not have such effect If it s a chum of high
- (15) quality closely substitutable yes it may effect the demand
- (16) The other point is it depends on quantities involved If
- (17) the product whose price has gone down is a very small quanti
- (18) in relations to the other product the impact on its price may
- (19) be very small
- (20) Q Now as I understood your testimony on direct it was your
- (21) finding that the prices of species of salmon red salmon other
- (22) than sockeye began falling in 1988 in Japan?
- (23) A I m sorry red salmon other than sockeye?
- (24) Q Yes Don t the Japanese refer to chum coho sockeye and
- (25) king if I haven t said it already as red?

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- (1) A I m accustomed to think of red meaning sockeye but you re
- (2) right those prices were slipping
- (3) Q Those prices were falling as early as 1988?
- (4) A Late 1988
- (5) Q And they trended down through the first quarter of 1989?
- (6) A We didn t monitor those closely because I was concentratin
- (7) on sockeye in general but I think that s a fair statement
- (8) Q Now let me take you to the bottom paragraph on this page
- (9) MR LYNCH I was just asked how long I m going to
- (10) be I ve got at least another three quarters of an hour
- (11) THE COURT Then we re going to quit
- (12) MR NEAL Judge I think in fairness to my partner
- (13) Mr Sanders I ought to explain why Mr Lynch referred to him
- (14) on that cross elasticities I found this boy from Johnson
- (15) Tennessee talking about counter intuitive up until he got in
- (16) this case he thought that was half back over right tackle I
- (17) can tell you
- (18) THE COURT On that happy note ladies and gentlemen
- (19) have a good weekend and don t read anything about the case
- (20) Would counsel stay for just a minute please?
- (21) (Jury out at 2 04 p m)
- (22) THE COURT On the record I wanted to know kind of
- (23) where we were timewise Are we going to finish up Monday as
- (24) you suggested?
- (25) MR O NEILL Yes I may have to cut out some

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- (1) processors
- (2) THE COURT That wouldn t cause a problem I suspect
- (3) MR NEAL No it wouldn t offend me at all Your
- (4) Honor
- (5) MR O NEILL But depending upon the length of the
- (6) cross-examinations I expect to finish on Monday and I ll
- (7) withdraw the processors now We have Dr Crutchfield Moore
- (8) Lohrer
- (9) MR NEAL Karpoff
- (10) MR O NEILL And Mendleson and that s it
- (11) MR NEAL Freeberg he s going to take care of them
- (12) MR O NEILL He took care of Freeberg and to the
- (13) extent Pat doesn t cross crucify him on Freeberg s testimony I
- (14) won t call him
- (15) THE COURT We had talked a few days ago about jury
- (16) instructions When might I expect to see something of your
- (17) product?
- (18) MR LYNCH I instructed Mr Daum that you were
- (19) looking for that He said he thought he would have something
- (20) Monday or Tuesday Is that all right?
- (21) THE COURT That s in the ballpark that s right
- (22) Mr Jamin or whoever are we on track for Monday Tuesday
- (23) for some proposed instructions?
- (24) MR JAMIN We will get them on track Your Honor
- (25) THE COURT Have a good weekend

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- (25) BY MR LYNCH 5086

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- (1) MR O NEILL Judge as a matter of focus the one
- (2) thing - the instructions will be relatively easy but just for
- (3) your information as a matter of focus the challenge is going
- (4) to be getting a verdict form that isn t as long as the Bible
- (5) and I think that is - we ll do our best on that
- (6) THE COURT They are very tough to write Let s be
- (7) working on it
- (8) MR LYNCH I think that s the reason it s taking
- (9) until Tuesday I might say in that regard the resolution of
- (10) this stipulation is very important to having a verdict form
- (11) that we know what it s going to mean
- (12) THE COURT We will be in recess subject to call
- (13) (Proceedings recessed at 2 08 p m)

- (1) EXHIBITS
- (2) DX2939 DX3283 DX3289 DX3293 DX3315 DX3327
- (3) DX3328 DX3329 DX3330 DX3331 DX3335
- (4) DX3336 DX3337 DX5120 DX5755 offered 4916
- (6) 318 offered 4987
- (7) 595 offered 5003
- (8) 5983 offered 5044
- (9) 431 offered 5071
- (10) 420 offered 5079
- (11) 419 offered 5081
- (12) 3652 3653 and 3820 offered 5085

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- (2) DX2939 DX3283 DX3289 DX3293
 (3) DX3315 DX3327 DX3328 DX3329 DX3330 DX3331 DX3335
 (4) DX3336 DX3337 DX5120 DX5755 received 4917
 (6) 318 received 4987
 (7) 431 received 5071
 (8) 420 received 5080
 (9) 419 received 5082
 (10) 3652 3653 and 3820 received 5086

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- (1) STATE OF ALASKA)
 (2) Reporter s Certificate
 (3) DISTRICT OF ALASKA)
 (6) I Leonard J DiPaolo a Registered Professional
 (7) Reporter and Notary Public
 (8) DO HERBY CERTIFY
 (9) That the foregoing transcript contains a true and
 (10) accurate transcription of my shorthand notes of all requested
 (11) matters held in the foregoing captioned case
 (12) Further that the transcript was prepared by me
 (13) or under my direction
 (14) DATED this day
 (15) of 1994
 (21) LEONARD J DiPAOLO RPR
 Notary Public for Alaska
 (22) My Commission Expires 2 3 96

Look-See Concordance Report

UNIQUE WORDS 2,916
TOTAL OCCURRENCES 14,522
NOISE WORDS 385
TOTAL WORDS IN FILE 43,380

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(IN THE UNITED STATES DISTRICT COURT
) FOR THE DISTRICT OF ALASKA
 In re) Case No A89 0095 CIV (HRH)
 5)) Anchorage Alaska
 The EXXON VALDEZ) Monday June 27 1994
 (6)) 8 00 a m

TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY 34th DAY
 BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE

(12) VOLUME 30 Pages 5116 5336
 Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 8 00 a m)
 (3) (Call to Order of the Court)
 (4) THE COURT Good morning ladies and gentlemen This
 (5) is the continuation of trial in case A89 0095 civil in re the
 (6) Exxon Valdez Good morning Dr Crutchfield Mr Lynch you
 (7) may continue your cross examination
 (8) Doctor you understand you re still under oath?
 (9) THE WITNESS I m sorry?
 (10) THE COURT You understand you re still under oath
 (11) THE WITNESS I understand sir
 (12) THE COURT Very well
 (13) CONTINUED CROSS EXAMINATION OF DR JAMES
 CRUTCHFIELD
 (14) BY MR LYNCH
 (15) Q Good morning Dr Crutchfield
 (16) A Good morning Mr Lynch
 (17) Q I wonder if you would turn again to 2047 2047 May I
 (18) approach Your Honor?
 (19) There it is right there I ll refer to these page numbers
 (20) just by the last three numbers there and the page I m on is
 (21) 170 170
 (22) A I m sorry?
 (23) Q If you look at the bottom of page 170 - just look at those
 (24) last three numbers
 (25) A Oh I see

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(1) Q Dr Crutchfield on Friday we were talking about the
 (2) Atkinson News Report of June 7 1989 and I think we left off
 (3) we hadn t talked about this Mr Atkinson reported on June 7
 (4) that the market is caught in a vicious cycle whereby the low
 (5) prices for product and inventory is causing reduced prices for
 (6) this year s production and lower prices for quote new end
 (7) quote product push the prices for carryover inventory down
 (8) even further
 (9) Now with reference to your previous analysis of salmon
 (10) prices sockeye salmon prices in Upper Cook Inlet you had
 used
 (11) June as the reference point when you evaluated inventories
 (12) isn t that correct sir?
 (13) A No that s not correct We used April 1st
 (14) Q In the Glacier Bay case?
 (15) A Oh in Glacier Bay?
 (16) Q Yes sir That was your previous analysis of sockeye
 (17) prices correct?
 (18) A I can t remember what the Glacier Bay date was - sorry I
 (19) can t bring that date to mind
 (20) Q You have in that booklet there a transcript of your
 (21) testimony in Glacier Bay and with the Court s permission I ll
 (22) bring you another copy so you don t have to lose your place
 (23) If you ll look at page 17 sir -
 (24) A Right
 (25) Q - you see that - if you begin at line 19 you see

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- (1) Mr O Neill asked you about P114 which was an exhibit that you
 (2) had prepared?
 (3) A Yes uh huh
 (4) Q And you described that as figures for June holdings of
 (5) frozen salmon products in Japan?
 (6) A Right
 (7) Q And you said you chose June because that s the period
 when
 (8) the last year s pack hopefully is pretty well cleaned out and
 (9) when the new pack is beginning to come correct?
 (10) A Yes
 (11) Q You said it s a good inventory - good indicator of
 (12) inventories held in anticipation of bridging the period until
 (13) new supplies come in?
 (14) A Yes
 (15) Q Then you said the higher the inventory the greater the
 (16) pressure on sellers?
 (17) A Correct
 (18) Q Now the reason that that s so as I believe you testified
 (19) on direct on Friday is that the product life of inventory is
 (20) about nine months is that correct?
 (21) A Well it can go longer but there are losses of quality if
 (22) you carry it longer and it s expensive to carry it
 (23) Q So if a processor has purchased inventory in this case in
 (24) 1988 and he gets into June of the following year he s facing
 (25) two problems or maybe three problems One the quality of the

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- (1) product he s holding is getting to the point where it s
 (2) beginning to deteriorate is that correct sir?
 (3) A That may be an extreme statement It is going down
 (4) certainly and he d like to clean that out prior to the time new
 (5) product comes in
 (6) Q And secondly the cost the accumulated cost of keeping it
 (7) frozen is growing and so his total cost is getting higher?
 (8) A That s correct
 (9) Q And particularly in 1989 holdings of inventory had been
 (10) acquired at record high costs is that correct sir?
 (11) A Yes
 (12) Q And thirdly new product is beginning to become available
 (13) to the market so buyers don t - can look forward to having new
 (14) product coming in from the current year s catch is that
 (15) correct sir?
 (16) A Shortly thereafter yes
 (17) Q And all of those things build up pressure on the holders of
 (18) inventory to sell the product that they re holding?
 (19) A Yes
 (20) Q Now we saw last week that - last Friday when we were
 (21) talking that as early as January it was being reported by Mr
 (22) Atkinson that holders of inventory were seeing the price
 (23) decline and were holding onto their inventory in hope that they
 (24) would be able to sell it at a higher price is that correct
 (25) sir?

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- (1) A That s correct for sockeye
 (2) Q And that continued - well Mr Atkinson reported that that
 (3) was correct for all salmon species didn t he?
 (4) A Yes
 (5) Q I m sorry I m not sure I heard your answer sir
 (6) A Yes that s correct
 (7) Q And as the - as the 1989 year moved forward past your
 (8) March 31 cutoff date processors continued to hold inventory
 (9) off the market hoping they could eventually get a higher price
 (10) isn t that correct sir?
 (11) A I - I really can t accept that as an accurate description
 (12) of what they were doing in terms of their motivation We saw
 (13) during this period that they were continuing to get relatively
 (14) high prices for sockeye right straight through the first
 (15) quarter of 1989 and into the second quarter At the same time
 (16) Mr Atkinson was saying - and I believe one of your
 (17) deposition - deposition of one of your experts was saying that
 (18) they were trying to liquidate inventory and I find myself hard
 (19) pressed to explain how they could be holding product off the
 (20) market to keep prices up and at the same time liquidating
 (21) inventory and at the same time importing products of the same
 (22) type from the United States
 (23) Q Well the importing the products - we ll get to the
 (24) importing of products but we agreed the importing of products
 (25) was probably products in which the Japanese buyers already had

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- (1) some investment?
 (2) A That s not necessarily so I don t know that to be so
 (3) These were - the export figures were reported as U S exports
 (4) which I would assume means that they were held in U S
 (5) ownership
 (6) Q By U S companies partially owned or financed by Japanese
 (7) companies is that correct?
 (8) A That s probably true yes
 (9) Q Now with reference you said we saw they were getting high
 (10) prices Where did we see that?
 (11) A In the wholesale prices that we showed on the exhibit that
 (12) was put up last Friday
 (13) Q And do you recall Mr Atkinson reporting and us discussing
 (14) last Friday that although it was listed at higher prices it
 (15) wouldn t sell at those prices?
 (16) A That - he said that yes I don t know that this was
 (17) necessarily true There s no indication in Mr Atkinson s
 (18) report of any volumes moving at those different prices The
 (19) prices that we showed and for wholesale are prices drawn from
 (20) the TCWM transactions actual transactions that took place so
 (21) I presume those were prices at which real sales were made
 (22) Q May I approach Your Honor?
 (23) I d just like to show you this document It s not an
 (24) exhibit but I believe that you ll recognize it sir as a
 (25) statistical compilation that you used

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- (1) A Yes
- (2) Q Now neither you nor I want to spend the time to find every line item in this computer printout but this is basically the source of your information about U S exports of salmon?
- (3) A I believe that is the case The actual gathering of those data was done by computer accessing the export data base in the Department of Commerce
- (4) Q And this is the National Marine Fisheries Service on statistic on U S monthly export of sockeye salmon fresh and frozen?
- (5) A Yes
- (6) Q Now I ll represent to you sir that if you go through here you ll find that there was a 26 percent price decline in those transactions Did you check into that sir?
- (7) A No I did not
- (8) Q And that the decline from the year earlier was - got as high as 30 percent that is for the equivalent month of the earlier year Would that indicate to you that these exports were being made in the face of a falling price?
- (9) A Well they certainly were being made and they were being made voluntarily so I assume they were being made on the assumption that the product could be sold profitably
- (10) Q Let s talk about that We understand you ve taught us that salmon caught in Alaska sockeye salmon or salmon caught somewhere else in the United States is good for about nine

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- (1) months to a year in storage its product life correct?
- (2) A Well I don t believe I stated that but that s close enough yes
- (3) Q Okay And so the salmon that we re talking about having been exported that was frozen salmon that had been caught in the prior season and that had to be sold sometime about June no matter where it was - where the freezer was or it would begin to lose its marketability isn t that correct?
- (4) A That s too extreme a statement again Mr Lynch that product can be held and still be in marketable saleable form for longer than nine months That isn t necessarily a limit The nine months really refers to the fact that thereafter new pack is coming in but there have been plenty of occasions where people have held over previous year s pack Not necessarily they wanted to but they did Rather than dump it they felt that they could hold it and do better
- (5) Q But when they hold it over there is a decline in product quality isn t that correct sir?
- (6) A There would be some decline yes
- (7) Q Okay And just as you said in Glacier Bay that the Japanese holders of inventory would begin to feel pressure to sell by the time June of the year ran around that would be just as true of U S holders wouldn t it?
- (8) A Yes
- (9) Q Because as you said the market for sockeye salmon is

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- (1) predominantly in Japan right?
- (2) A I m sorry?
- (3) Q The market for U S Alaska caught sockeye salmon is predominantly in Japan?
- (4) A Yes that s correct
- (5) Q So if someone is holding a warehouse full of frozen sockeye salmon he anticipated he better get that to Japan sooner or later if he wants to sell it correct?
- (6) A Yes
- (7) Q If he comes into the first quarter of the following year and he sees falling prices and he s got a warehouse full of sockeye salmon there s some pressure on him to find a market for that salmon over in Japan correct?
- (8) A The statement you made though is not entirely true He would not have been looking at falling prices in the first quarter of 1989 Those prices held up at wholesale through May and it wasn t until then that they began to drop sharply
- (9) Q I ll represent to you again Dr Crutchfield that this computer data base which you used to create that chart and we ll put in the evidence but I ll represent to you for purposes of discussion that the price at which those exports were transferred fell 28 percent over three months You didn t look into that did you?
- (10) A No no I didn t see that
- (11) Q Now let s go on to the next issue if I can find it here

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- (1) of Mr Atkinson s report That s on - we ve been looking at June 7 Let s look at June 14 Will you turn to page 174 in Exhibit 2047? I m referring to that machine written number at the bottom of the page
- (2) A Right
- (3) Q You see a week later Mr Atkinson reports that the Japanese market for salmon has been hit with a double punch as the new season begins See that sir?
- (4) A Yes uh huh
- (5) Q And the first punch is that there have been record imports That s what we ve just been talking about correct?
- (6) A Correct
- (7) Q And a growth in the fist three months of 269 percent correct and that led according to Mr Atkinson to aggressive competition to move product is that right?
- (8) A Right
- (9) Q And it resulted in a continuing decline of wholesale prices of all species That s what Mr Atkinson reported correct?
- (10) A Yes
- (11) Q He goes on to say this includes the price of sockeye salmon although the supply is not necessarily excessive That was your point on direct correct sir?
- (12) A Yes
- (13) Q And he goes on to say something we talked about earlier this morning while frozen Bristol sockeye is still quote

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- (1) listed end quote at relatively high levels actual sales are
 (2) only made at about a thousand - 1100 yen per kilo is that
 (3) correct sir?
 (4) A Yes
 (5) Q As opposed to the previous year s starting price in Tokyo
 (6) of about 1400 yen per kilo?
 (7) A Yes
 (8) Q And when you take 1100 yen per kilo and work it back to an
 (9) ex vessel or grounds price it comes out a little over a dollar
 (10) a pound doesn t it sir?
 (11) A Yes I might point out sir you re still talking about
 (12) June and our discussion earlier was about January February
 (13) and
 (14) March This was the period we were concerned with as the
 (15) period in which expectations as to next year s supply and
 (16) demand conditions are basically formed
 (17) Q Now let s - let me just take that point try to stay with
 (18) it for a second What you meant by that answer is that in your
 (19) study you only look at January February and March?
 (20) A In the formation of our model yes that s correct
 (21) Q And you assumed that what market - what buyers and sellers
 (22) in Tokyo guessed judged predicted interpreted about the
 (23) market took together all the factors of supply and demand and
 (24) all those factors that go together to make a price is that
 (25) correct sir?
 A That s correct

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- (1) Q And your judgment was that they were pretty optimistic in
 (2) those first three months correct?
 (3) A That s correct
 (4) Q And then you run down the curtain and you said anything
 (5) that happened after March 31 that must be attributable to the
 (6) oil spill correct?
 (7) A Not entirely but very substantially yes
 (8) Q Your model and your testimony on direct assigned the
 (9) differential between your predicted fourth quarter price in
 (10) relation to the first quarter price entirely to the oil spill
 (11) is that correct sir?
 (12) A Yes uh huh
 (13) Q But in fact in June according to Mr Atkinson the salmon
 (14) market was hit by a double punch correct?
 (15) A That s what he says yes
 (16) Q And one of those punches was that imports had grown much
 (17) more than people had anticipated and than you had studied in
 (18) your first three months correct?
 (19) A Right
 (20) Q And he reported that as a result of that growth in import
 (21) prices were declining correct?
 (22) A Right
 (23) Q And he goes on to say in this next paragraph down here that
 (24) a further blow has been that it cost the Japanese consumer
 (25) more
 to buy a salmon because the value of the yen relative to the

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- (1) dollar has gone down?
 (2) A Well by a very small amount yeah
 (3) Q Well enough of an amount to be described by Mr Atkinson
 (4) in this report as having driven ex vessel prices to about a
 (5) dollar a pound?
 (6) A I - I don t believe that the export - the exchange rate
 (7) change would have had a major influence at that point The
 (8) change was not very substantial Anyone who was really
 (9) concerned about the possibility of changes in exchange rates
 (10) has available to him the option to choose by Japanese firms of
 (11) hedging against any change in exchange rates That was the
 (12) first interruption for some years of a longer term downward
 (13) trend in the value of the dollar which terminated - well
 (14) hasn t terminated at all It s continued right straight
 (15) through since then
 (16) Q Certainly happening right now isn t it?
 (17) A Yes it is that
 (18) Q Dr Crutchfield you ll at least agree with me that as
 (19) knowledgeable as well informed an observer of the Japanese
 (20) market as Mr Atkinson whether you agree with him or not on
 (21) June 14 his perception was that the change in the exchange
 (22) rate
 had been a blow to the Japanese salmon market?
 (23) A That s what he states and I simply don t agree with that
 (24) Q You don t agree with that?
 (25) A No

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- (1) Q And he was predicting as of June to readers of his news
 (2) report that the effect of that blow would be to drive salmon
 (3) prices for fishermen ex vessel prices down to a dollar a
 (4) pound?
 (5) A That s what he states yes Let me again reiterate my
 (6) position that we did not use second quarter prices in
 (7) constructing our model for precisely the kinds of reasons
 (8) you re talking about All sorts of odd things happened in the
 (9) second quarter depending on inventory situations and other
 (10) developments that could not have been foreseen prior to that
 (11) time So the prices during that period would not really be
 (12) fully representative
 (13) They re also prices that occur after the spill and tend to
 (14) incorporate any adverse affects that might be anticipated on
 (15) the part of the trade by the spill as we came into the next
 (16) year s pack
 (17) Q Let me go back - let me go on to the next page of this
 (18) report I just want to follow up with you though a little
 (19) bit on that last answer if I may
 (20) You told us when you were being examined by Mr - I can t
 (21) hit the right button - you told us when you were being
 (22) examined by Mr O'Neill that traders in the Tokyo salmon
 (23) market
 (24) are concerned about the risk of committing to purchase a
 (25) product which they have to buy on a short time and hold for a
 long time correct?

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- (1) A That s correct
 (2) Q And that they re sophisticated and that they re
 (3) experienced knowledgeable businessmen and that s why you
 used
 (4) the Tokyo market as the apotheosis of market forces correct?
 (5) A That s correct
 (6) Q Now you re not telling this jury are you that Tokyo
 (7) traders after March 31 of the year have their hands tied if
 (8) something happens in the market that shows them that they ve
 (9) got to lower their prices or they re going to lose money?
 (10) A No
 (11) Q So anything that happens in the second quarter of the year
 (12) that is the time from the end of March until the time the fish
 (13) come in is something that they would have to take account of
 (14) isn t it?
 (15) A Yes they d have to take account of it primarily with
 (16) respect to the fish that they got in the previous year It
 (17) does not necessarily refer directly to incoming fish They
 (18) haven t got any incoming fish from the 89 pack yet A
 (19) dribble but no more than that
 (20) Q Right they haven t got any fish but they re talking to
 (21) the people that buy fish in the United States about what
 (22) they re willing to pay correct?
 (23) A That s correct
 (24) Q If the yen doesn t buy as many dollars as it used to buy
 (25) they can t make a commitment to pay the same number of
 dollars

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- (1) unless they re able to get an additional number of yen right?
 (2) A Yes although again the change in the exchange rate
 (3) during that period was relatively small
 (4) Q Whether that was so or not you ll agree the market has to
 (5) react to something like that?
 (6) A It has to react to it if it s enough to affect what goes on
 (7) for a full year thereafter and if they feel that the risk of
 (8) exchange rate changes is too great there s a ready mechanism
 (9) available to them to hedge against that
 (10) Q Well that mechanism doesn t - doesn t retroactively
 (11) change a decline that s already occurred That s a hedge that
 (12) can go into the future isn t it sir?
 (13) A That s correct
 (14) Q And if at the time they make the purchase it s their
 (15) judgment that they can t afford to pay more than a dollar a
 (16) pound for the fish in the United States if they want to pay
 (17) for it - if they want to recover a profit in Japan they won t
 (18) pay more than a dollar a pound will they hedge or no
 (19) correct?
 (20) A No that s correct
 (21) Q Now let s go on to Page 2 You see where Mr Atkinson
 (22) reports something about the False Pass sockeye prices Now
 (23) what is False Pass?
 (24) A It s an area in which there is a sockeye run where fish are
 (25) taken

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- (1) Q Is it one of the early runs?
 (2) A Yes
 (3) Q And they re concerned about the price that s being paid
 (4) there I think you ll see from the context they re concerned
 (5) that the price that s being paid in the United States is too
 (6) high Mr Atkinson s reporting in substance that Japanese
 (7) buyers are concerned that processors are expecting them to
 pay
 (8) too high a price is that correct?
 (9) A That s what he says uh huh
 (10) Q He cites three reasons does he not?
 (11) A This next page is so blurred I can t read it
 (12) Q Let me see if I can read it He says one the wholesale
 (13) prices for most species of salmon have dropped considerably
 (14) since the start of the year and this puts pressure on the price
 (15) for sockeye?
 (16) A Where are you reading Mr Lynch?
 (17) Q May I approach Your Honor?
 (18) A I m having trouble locating it
 (19) Q It s on the second page sir
 (20) Oh no wonder you re having a problem Let me see if I can
 (21) give you a better copy
 (22) You have any objection to my highlighting? I ll give you
 (23) my sheet here
 (24) You see where I ve highlighted there s a number next to
 (25) it I don t know what it is but it begins the Japanese are

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- (1) concerned however about False Pass sockeye prices for
 several
 (2) reasons?
 (3) A Yes I see that
 (4) Q The wholesale prices for most species of salmon have
 (5) dropped considerably since the start of the year and this puts
 (6) pressure on the price for sockeye second the Japanese
 (7) land based high sea salmon fleet is landing a larger percentage
 (8) of sockeye than expected and three - that s another
 (9) unforeseen inventory issue correct sir?
 (10) A I m sorry?
 (11) Q The second point refers to the fact that they were - that
 (12) the inventory of sockeye was going to be larger than had been
 (13) previously anticipated?
 (14) A Well the Japanese catch of sockeye their own catch is a
 (15) very small fraction of the total less than five percent
 (16) Q You think Mr Atkinson s wrong when he says the Japanese
 (17) were concerned about that?
 (18) A They may well have been concerned but the amount
 involved
 (19) is so small that it s hard to see how that would influence
 (20) market expectation in any significant way Total Japanese
 (21) catch is - for the last few years has been about five percent
 (22) or so of the total of imports
 (23) Q But in this year it was greater than expected because they
 (24) were catching more sockeye than the past five years correct?
 (25) A Apparently so

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- (1) Q And then three the Japanese yen is continuing to weaken
 (2) reducing the buying power of the Japanese correct?
 (3) A Again I must state that I looked - I haven't - can't
 (4) bring the exact figures to mind although I have them but the
 (5) actual increase in the value of the dollar during this period
 (6) which is a function of the budget deficit that we were running
 (7) at the time very large budget deficit the actual increase in
 (8) the value of the dollar the - if you like the weakening of
 (9) the yen was very small It never exceeded six to nine percent
 (10) Q But small or large a market can become jittery and nervous
 (11) about that kind of situation is that correct sir?
 (12) A It could You have not mentioned the fact though that
 (13) the - that it's mentioned here in Atkinson's report that the
 (14) market was also very jittery about the impact of the oil
 (15) spill This was a major factor
 (16) Q I'm going to - I'm going to mention that trust me I'm
 (17) going to get to that
 (18) A Very good
 (19) Q You see that in this report on June 14 three months after
 (20) you rang down the curtain Mr Atkinson reports the Japanese
 (21) are expected to move slowly this year and buy with caution
 (22) You have any reason to doubt the accuracy of that report by Mr
 (23) Atkinson?
 (24) A No I don't
 (25) Q If you go to the June 21 report - someone recommended to

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- (1) about the oil spill and I assume you're referring to the spill
 (2) by the Exxon Valdez That's covered in the next paragraph
 (3) down Alaska salmon information?
 (4) A Yes
 (5) Q You see what Mr Atkinson reports there? Could you read
 (6) that at the start of that paragraph?
 (7) A The effect of the oil spill in Prince William Sound is
 (8) being stressed by the fishermen as they stress for strong
 (9) ex vessel price
 (10) Q Now that report says that the fishermen are stressing the
 (11) oil spill does it not sir?
 (12) A Yes
 (13) Q And what would cause - how could the fishermen possibly
 (14) get some benefit out of this oil spill in dealing with their
 (15) Japanese customers?
 (16) A I don't think that's what they're saying What they're
 (17) saying is that the fishermen are concerned about the likelihood
 (18) that the oil spill will be used as a weapon in negotiating a
 (19) large downward push in prices which in fact happened as it
 (20) had happened before in the Glacier Bay case
 (21) Q You think that's what Mr Atkinson is reporting here?
 (22) A Mr Atkinson is reporting what he learns from the trade
 (23) The trade is not going to tell Mr Atkinson that it is going to
 (24) use the effect of the spill as a bargaining weapon in trying to
 (25) get lower prices It would be foolish for them to make that

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- (1) me that I get bifocals and take the glasses off to see the
 (2) paper and I can't read the screen
 (3) THE COURT Doesn't solve all the problems does it?
 (4) MR LYNCH You recommend against them Your Honor?
 (5) THE COURT Oh I don't know
 (6) THE WITNESS You're looking at the report for June
 (7) 28?
 (8) BY MR LYNCH
 (9) Q June 21 sir it's Page 178 at the bottom It's the next
 (10) week after the one we've been talking about begins with high
 (11) seas sockeye
 (12) A Right
 (13) Q And Mr Atkinson reports that the price of high seas
 (14) sockeye continue to fall as medium driftnet fleet prepares to
 (15) end operations?
 (16) A Right
 (17) Q And he says there down in the - toward the bottom of the
 (18) paragraph the decline in beach prices is attributed to one
 (19) the generally soft salmon market and two prices on the
 (20) consumer wholesale markets correct?
 (21) A Yes
 (22) Q Now these were - these were developments that occurred
 (23) after March 31 correct?
 (24) A Right
 (25) Q Now you told me - you took me to task for not talking

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- (1) kind of statement to him
 (2) Q If the trade tells Mr Atkinson they're going to use
 (3) exchange values to bargain for a lower price you don't think
 (4) that's significant Or the trade tells Mr Atkinson they're
 (5) going to use the Russian/Japanese negotiations over high seas
 (6) salmon to bargain for a lower price they're going to use the
 (7) chum harvest to bargain for a lower price they're going to use
 (8) the price of foreign trout for lower price but they're not
 (9) going to tell him about this matter?
 (10) A I think those are very different matters Those are
 (11) objective facts which he can bring to bear but I repeat I
 (12) cannot imagine anybody in the wholesale trade either in Japan
 (13) or in the United States saying specifically that fear of real
 (14) disturbance in the market caused by the oil spill is going to
 (15) be used as a weapon to lower prices to fishermen That is not
 (16) something that -
 (17) Q Isn't it a fact that the natural reading of this sentence
 (18) and what any informed reader would take is that the fishermen
 (19) were saying to the Japanese suppliers you better pay us a high
 (20) price for our salmon because supply will be down due to
 (21) closures caused by the oil spill?
 (22) A No that's not I think what they're saying at all
 (23) Mr Lynch What they're saying is that they do not want a
 (24) repeat of what they saw during the Glacier Bay case and of the
 (25) rumors that they were hearing going around about what the

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- (1) opening price might be
 (2) Q So that's what you interpret Mr Atkinson to be saying
 (3) here?
 (4) A That's right.
 (5) Q Now let's just go on to the next page of this same report
 (6) where he talks about Kodiak That's page 179
 (7) A I'll do the best I can
 (8) Q Is that another bad page?
 (9) A Yeah
 (10) Q Your Honor may I?
 (11) A I can - well thanks
 (12) Q Now Mr Atkinson reports there there is pressure from
 (13) fishermen for high ex vessel prices for sockeye salmon if and
 (14) when the fishery begins but the Japanese point out that Kodiak
 (15) accounts for only 9 percent of the total sockeye landings The
 (16) effect on the overall market therefore should be limited
 (17) Is there any doubt in your mind that in this instance Mr
 (18) Atkinson is reporting that the fishermen are using the oil
 (19) spill as a weapon in their negotiation with the buyer of their
 (20) salmon?
 (21) A Mr Lynch if you go back and look at the record of
 (22) negotiations between fishermen and the buyers of salmon
 (23) whether it be sockeye or anything else this is exactly the
 (24) position that each group takes At the beginning of the
 (25) negotiation price the fishermen will muster all the reasons

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- (1) they can think of why they should get a higher price
 (2) Q Right
 (3) A The processors will muster all the reasons they can think
 (4) of why the price should be lower There's nothing different in
 (5) that than would have occurred in any other year except that
 (6) now we have a major event the impact of which as we heard
 (7) testimony on the other day was unknown but created a great
 (8) deal of uncertainty and concern in both consumer and trader
 (9) minds
 (10) Q Now the reference here though is to concern asserted by
 (11) the fishermen that there wouldn't be enough production?
 (12) A Yes it is
 (13) Q And the argument that because there isn't going to be
 (14) enough production you ought to pay us a higher price?
 (15) A That's what they're asking for
 (16) Q And the Japanese respond to that not by saying anything
 (17) about consumer concern not by saying anything about
 (18) uncertainty but saying you guys account for only nine percent
 (19) of the catch correct?
 (20) A Right
 (21) Q And they say that they're going to wait out - that the
 (22) real concern is reduced - that Prince William Sound will
 (23) result in reduced landings and total elimination of production
 (24) in that district correct?
 (25) A Yes

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- (1) Q And that's also a supply concern is it not?
 (2) A That is correct
 (3) Q Now if you'll turn to the report for June 28th is that a
 (4) legible copy?
 (5) A What is the page number?
 (6) Q 184
 (7) A Right
 (8) Q And you see there the prospects for good - this is the
 (9) second paragraph on the subject of Bristol Bay sockeye?
 (10) A Yes
 (11) Q Prospects for good landings are expected to support the
 (12) already softening market in Japan where the wholesale price
 (13) for high seas sockeye continues to drop?
 (14) A Yes
 (15) Q There are reports that some packers are already indicating
 (16) an ex vessel price of one dollar per pound correct sir?
 (17) A Yes
 (18) Q Now that - that report relates again to the anticipated
 (19) impact of higher supplies isn't that correct sir?
 (20) A Yes
 (21) Q Now let's turn to the second page of that same report
 (22) That deals with salmon supplies specifically does it not sir?
 (23) A Yes it does
 (24) Q And in the last sentence of the - second to the last
 (25) sentence - last two sentences of the first paragraph Mr

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- (1) Atkinson reports salmon imports are also expected to reach
 (2) 200 000 tons this season a 35 percent increase over the 1988
 (3) season right?
 (4) A Yes
 (5) Q And the increase in imports will be the result of increased
 (6) landings of wild salmon in North America That means they're
 (7) catching more fish in North America correct?
 (8) A They're hoping to or expecting to yes They haven't got
 (9) them yet
 (10) Q They caught some of them because he's already reported
 on
 (11) False Pass and he's already reported on what's going on in
 (12) Bristol Bay?
 (13) A He's talked about False Pass which is a relatively small
 (14) early fishery and the early catch in Bristol Bay well before
 (15) the big part of the run has come through he doesn't know yet
 (16) Q Even then catches were exceeding previous catch?
 (17) A Yes
 (18) Q And the high seas were greater than the - than previous
 (19) catches?
 (20) A Yes but again that's a small part less than five
 (21) percent of the total catch
 (22) Q So increased landings in North America coupled with
 (23) efforts to promote great effort of farmed salmon to Japan and
 (24) world salmon production during the 1989/ 90 season is
 expected
 (25) to jump to 310 000 tons a 73 percent increase over the 1988

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- (1) and 89 season therefore the total for the 1989/ 90 season
 (2) could be as much as 400 000 tons is that correct?
 (3) A Yes but let me point out that if you take that total world
 (4) production figure and take out the huge increase in production
 (5) of pink salmon and the very large increase in production of
 (6) Atlantic farm salmon largely from Norway the actual increase
 (7) was something in the neighborhood of 20 to - 20 to 30 000
 (8) tons It was not a spectacular increase and it followed four
 (9) years of declining catches Pinks do not compete directly with
 (10) sockeye in the Japanese market and at that time in 1989 the
 (11) total amount of farmed salmon farmed Atlantic salmon coming
 (12) into the Japanese market was very small
 (13) Q So it s your position that these problems really weren t
 (14) problems at all?
 (15) A What I m saying is that the market for salmon worldwide is
 (16) not a market in which fish flow freely from all producing areas
 (17) to all consuming areas The Japanese market did not take
 (18) large
 (19) amounts - in fact it took very small amounts of farmed
 (20) Atlantic salmon which is by far the largest element in that
 (21) increase in aquaculture output They did take increased
 (22) supplies of coho from Chile but again coho is not a perfect
 (23) substitute or a strong substitute for sockeye
 (24) Actually what I m saying is the large part of the jump in
 (25) world production that you mentioned went to markets that did
 not compete at all with sockeye or competed only in very

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- (1) limited degree in Japan that is
 (2) Q Let me just turn to the next page of this same report
 (3) sir Is it - are you changing your view of Mr Atkinson s
 (4) knowledge of the Japanese market and his - the accuracy of his
 (5) sources?
 (6) A No I think all I can say is that what he is reporting is
 (7) what he hears from the Japanese trader groups and this is
 (8) probably being reported very accurately
 (9) Q What he reads in the Japanese trade press correct sir?
 (10) A That s correct I cannot see any possible reason why
 (11) either Japanese traders or the Japanese trade press which
 (12) reflects pretty strongly their views would want to publicize
 (13) any possible negative effects on the market of a big oil spill
 (14) Q But they would want to publicize negative effects of
 (15) everything else that might help them to get a lower price is
 (16) that your interpreting?
 (17) A These are things that could be observed easily in the
 (18) market There was no uncertainty about these and all of them
 (19) taken together are a relatively small part of total supply
 (20) We re talking about a total supply in 1989 of 350 000 metric
 (21) tons and the areas you re talking about are a small fraction
 (22) of that
 (23) Sure he will report these and he s correct in reporting
 (24) them as he is but nothing has been said in anything you ve
 (25) read so far as to the impact on the demand side on the part of

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- (1) the traders All of it has been talk about impact on the
 (2) supply side
 (3) Q Look at the first sentence on Page 3 of this report Mr
 (4) Atkinson is talking about salmon supply talking about the -
 (5) the Japanese market not talking about Norway not talking
 (6) about Seattle but the Japanese market says while there are
 (7) various reasons for the rapid decline this year And I m sure
 (8) if you read back you ll see that -
 (9) A Excuse me?
 (10) Q Page 3
 (11) A Oh okay
 (12) Q The large increase in farmed imports just as the new season
 (13) was about to begin parentheses relatively low prices caused
 (14) confusion in the marketplace
 (15) A I cannot agree with Mr Atkinson s interpretation of that
 (16) The total amount in aquaculture that came into Japan in the
 (17) year we re concerned with 1989 was about 16 000 tons The
 (18) total amount of Atlantics which are alleged to be the
 (19) principal competitor of sockeye in this aquaculture component
 (20) came to significantly less than that because a large chunk of
 (21) the imports were coho coming in from Chile
 (22) Total amount for example coming in from Norway in 1989
 (23) was only about 7 000 metric tons Compare that to 350 000
 (24) metric tons of total supply That goes into the market without
 (25) a nipple

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- (1) Q Now I promised Mr O Neill that I would try to finish
 (2) within the hour this morning so you could go home and I m
 (3) going to try to do that and I ve got a little bit more material
 (4) I need to cover here
 (5) Let me just ask you a few questions about your model
 (6) First of all your model was designed by you and by your
 (7) colleagues only to evaluate sockeye salmon in Upper Cook
 Inlet
 (8) correct?
 (9) A That s correct and let me make it clear that the actual
 (10) modeling work was done by Mr Mark Freeberg one of the
 (11) partners of NRC I am not myself a modeler I asked some
 (12) questions which I wanted answered Mr Freeberg did the
 design
 (13) and execution of the model
 (14) Q You are not yourself an econometrician as they call it?
 (15) A I m not an econometrician
 (16) Q You couldn t construct this model on your own if you wanted
 (17) to correct?
 (18) A I won t answer that yes or no I think I could have
 (19) managed it but why should I when I had an expert
 (20) Q I see So Mr Freeberg is a number cruncher?
 (21) A Mr Freeberg is a lot more than a number cruncher sir
 (22) Q I m just trying to understand I understood you to say
 (23) that you re not qualified as a modeler That s what you
 (24) testified at your deposition?
 (25) A That s correct uh huh

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- (1) Q Now you just said you think you could create a model and
 (2) I'm confused whether Mr. Freeberg is the modeler or you're the
 (3) modeler?
 (4) A What I was - and the answer to your question was I guess
 (5) half serious and half not. The model that was actually
 (6) constructed is a very simple regression. It is not a complex
 (7) multi-variant model which would have required large amounts
 of
 (8) expertise. All I was saying is that while I possibly could
 (9) have constructed that model, I felt no impulse to do so since I
 (10) had a person in the firm for whom that specific
 (11) responsibility -
 (12) Q Well, it is true though that you are not a qualified
 (13) modeler, is that correct?
 (14) A That is certainly true.
 (15) Q And it's a possibility that you could have constructed it
 (16) but that's not what you do, correct?
 (17) A That's correct.
 (18) Q And not what you've done in your career?
 (19) A Right.
 (20) Q Now with reference to this model you mentioned in passing
 (21) when you were talking to Mr. O'Neill that you adjusted the
 (22) Tokyo Central Wholesale Market prices, isn't that correct, sir?
 (23) A Yes, uh, huh.
 (24) Q Now let me ask you if you would look at Exhibit DX1842 for
 (25) identification, which is the first tab I think in your book.

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- (1) A Correct.
 (2) Q Do you recognize this as an initial draft of the report
 (3) that you prepared for Mr. O'Neill and his colleagues on your
 (4) study of grounds prices for sockeye salmon in connection with
 (5) the Exxon Valdez matter?
 (6) A That's correct.
 (7) Q Would you turn to Page 24. Now this is not the report
 (8) that you ultimately made, correct, this is a first draft?
 (9) A That's right.
 (10) Q Okay. Now I'd like to address your attention to the last
 (11) paragraph on that page, which says, note that a real price is
 (12) being regressed against a nominal price in this equation. You
 (13) see that, sir?
 (14) A Yes, I do.
 (15) Q Now as an economist, could you tell us what you mean
 when
 (16) you say a real price is being regressed?
 (17) A The real price is the actual or nominal price adjusted to
 (18) remove as far as possible the effects of inflation, to express
 (19) it in constant dollars.
 (20) Q Sometimes we talk about 1989 dollars or 1990 dollars, or
 (21) what would a steak cost in 1900 dollars?
 (22) A That's correct.
 (23) Q What you do is find out if a steak sold for \$1.50 in 1900
 (24) and you take all the inflation to see that it still costs \$19
 (25) today, correct?

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- (1) A That's right.
 (2) Q And inflation is a real factor in the way markets work, is
 (3) that correct?
 (4) A Yes, it is.
 (5) Q And is another aspect of this making sure that you have the
 (6) exchange rate correct?
 (7) A Correct.
 (8) Q Now the paragraph goes on to say this approach is
 (9) reasonable since the Japanese buyer should incorporate the
 (10) overall market condition in his buying power and the Japanese
 (11) consumers' purchasing power into his analysis of the
 (12) appropriate price to pay for Alaska salmon. Do you agree with
 (13) that statement, sir?
 (14) A That's correct.
 (15) Q And as such, the market analysis must include the effect of
 (16) inflation and the exchange rate on the offering price, correct?
 (17) A Yes.
 (18) Q What we're just saying one way or the other is that nothing
 (19) more than the fact that what we've talked about earlier, if the
 (20) exchange rate changes, the cost to a Japanese buyer may go
 up
 (21) or down, greater than the advantage to the U.S. fishermen?
 (22) A That's right. May I point out, however, that the exchange
 (23) rate is used in this particular model as an annual average
 (24) exchange rate. We had done some work earlier that I'd asked
 (25) Mark to do, which indicated that short-term changes in the

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- (1) exchange rate had very little effect. We couldn't distinguish
 (2) any identifiable effect on prices in the market, so it was
 (3) perfectly logical. You don't respond to month-to-month
 (4) changes, if they run on longer than that, yes, then the effect
 (5) of the exchange rate becomes important. That's why in the
 (6) annual rates that we used, we made that adjustment.
 (7) Q Now in the preceding paragraph you say - or said in this
 (8) draft, the first quarter Tokyo wholesale market price was
 (9) adjusted in two ways: Tokyo prices were adjusted for domestic
 (10) purchasing power, i.e., Japanese inflation, using the Japanese
 (11) consumer price index over the 1973 through 1989 period, is that
 (12) correct?
 (13) A That's correct.
 (14) Q Furthermore, the effect upon price of changes in the yen to
 (15) dollar exchange rate were also incorporated by dividing the
 (16) inflation-adjusted Tokyo price by the real yen to dollar
 (17) exchange rate, correct, sir?
 (18) A That's correct.
 (19) Q And the real yen to dollar exchange rate, like a real
 (20) price, is one that's adjusted for inflation, right?
 (21) A Yes. That was not, however, the final form in which the
 (22) model was used. You're reading from an earlier draft.
 (23) Q Yes, I am, and I'm trying to establish that you didn't do
 (24) this, isn't that correct, sir?
 (25) A Yes.

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- (1) Q What you did is instead of using the formula universally
 (2) accepted by economists for carrying out this kind of
 (3) adjustment you inverted the factors did you not sir?
 (4) A That s correct sir
 (5) Q Whereas other economists divide the - the Japanese
 (6) exchange rate by the Japanese inflation factor you divided it
 (7) by the U S inflation factor?
 (8) A That s correct
 (9) Q And you divided the U S dollar by the Japanese inflation
 (10) factor?
 (11) A Yes
 (12) Q Do you know of anyone anywhere who s ever done that
 (13) before?
 (14) A No I don t The - the attempt in adjusting the exchange
 (15) rate was to find a way of recognizing that at the start of our
 (16) period the imports of sockeye from Upper Cook Inlet in fresh
 (17) and frozen form were relatively small Over the course of the
 (18) 14 years that were included in the analysis that proportion
 (19) increased to a very substantial amount We tried to find some
 (20) way of adjusting the exchange rate to reflect the fact that a
 (21) larger and larger proportion of Upper Cook Inlet sockeye were
 (22) going through the Japanese/American exchange rate
 (23) Q During that period of time Japanese cars were being sold
 (24) in larger and larger percentages in the United States isn t
 (25) that correct sir?

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- (1) A Yes they were
 (2) Q Did the effect of that higher sale of Japanese cars in the
 (3) United States mean that U S inflation affected the Japanese
 (4) yen that you should calculate what the yen is worth on the
 (5) basis of the U S inflation factor?
 (6) A The exchange rate - I ll give you sort of a bleak answer
 (7) The exchange rate during the period in question was
 responding
 (8) to some highly unusual circumstances Normally we would
 expect
 (9) the exchange rate to reflect the influence of relative rates of
 (10) inflation in the two countries involved In this period the
 (11) United States was running a huge budget deficit which could
 (12) not be financed out of the savings of American consumers or
 (13) business people in all so that a large part of the influence
 (14) on the exchange rate during that period had nothing to do with
 (15) sales of goods and services It was largely a flow of
 (16) financial finance so the exchange rate lost a good deal of its
 (17) direct link to trade during that period
 (18) Q Well if you were buying travelers checks in U S dollars
 (19) and you wanted to go to Japan and get yen you paid the
 (20) exchange rate right?
 (21) A That s true
 (22) Q And you paid the exchange rate based on the Japanese
 (23) inflation rate?
 (24) A In part
 (25) Q You didn t pay it on the basis of the U S inflation rate?

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- (1) A Right
 (2) Q You go to Japan you use the Japanese inflation rate?
 (3) A Yes
 (4) Q You go to the United States you use the United States
 (5) inflation rate?
 (6) A Yes
 (7) Q Your formula reverses that?
 (8) A That s right
 (9) Q You know Dr Mendelsohn?
 (10) A Yes
 (11) Q You testified in this case about your perception that there
 (12) was an oil spill impact on price right?
 (13) A Uh huh
 (14) Q And you rely on your model to show the fact of that impact
 (15) correct?
 (16) A Yes
 (17) Q You haven t testified to any numbers correct?
 (18) A I m sorry?
 (19) Q You have not testified to any measurement of the exact
 (20) impact?
 (21) A I did in the report that was submitted to the attorneys and
 (22) the forecast price is included in this analysis yes
 (23) Q But that s not what you ve come here to testify to this
 (24) jury about correct sir?
 (25) A I m not sure exactly the point you re driving at Yes the

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- (1) purpose of our study was to provide an estimate of what the
 (2) price would have been absent the spill and that forecast price
 (3) is in our report
 (4) Q In your report but not in the exhibits that you ve offered
 (5) into evidence in this case is it?
 (6) A That s correct
 (7) Q Okay Dr Mendelsohn is going to come and testify about
 (8) that correct?
 (9) A No He may on that but we were prepared to indicate what
 (10) our model indicated the price would have been supported by
 our
 (11) analysis of market conditions during the first three months of
 (12) 89 that we were concerned with and i -
 (13) Q And Dr Mendelsohn - are you familiar with Dr
 (14) Mendelsohn s method of calculating prices?
 (15) A No I did not look at Dr Mendelsohn s study at all
 (16) Q Would it surprise you when he tried to evaluate the impact
 (17) of Japanese yen on purchasing power he used the Japanese
 (18) inflation factor?
 (19) A No
 (20) Q Would it surprise you when he wanted to know about the
 (21) U S dollar and inflation factor he used the factor on the
 (22) U S dollar?
 (23) A No that wouldn t surprise me
 (24) Q Now I have a few final questions I think we ve
 (25) established that going into the sockeye season in Alaska there

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- (1) had been runs in other fisheries that exceeded expectations is that correct?
- (2) A In a few very small cases yes We don't really get any clear idea of what the next year is going to look like until
- (3) you are pretty well through the Bristol Bay run That's the biggest single factor in Alaska sockeye production So until
- (4) you know how that's going to go you really don't have any clear picture of what the supply from Alaska is going to be
- (5) just from small runs in False Pass or Chignik
- (6) Q But it is the fact that runs on which the Japanese market relies were greater than expected coming into the Alaska run
- (7) isn't that correct sir?
- (8) A Yes
- (9) Q Whether you think it's important or not that was the case?
- (10) A Well the expectations on which the negotiations take place occur before we know Not only what demand is going to be for the forthcoming year but what supply is going to be The best indication we have while those negotiations are going on are forecasts of Alaska runs in Bristol Bay from the Fisheries Research Institute at the University of Washington and the ADF&G forecasts for Alaska Those are forecasts only and they're subject to wide errors
- (11) So it takes a good deal of uncertainty on both sides
- (12) Supply and demand have to be evaluated in that negotiation
- (13) Q In 1989 the forecasts were strong?

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- (1) A Forecast was good
- (2) Q And the forecasts were exceeded?
- (3) A Yes they were exceeded substantially
- (4) Q I'm showing you DX2804 That's a chart you prepared is that not correct sir a chart you used in Glacier Bay?
- (5) A I cannot be sure It may well have been I'm not sure
- (6) Q Does it accurately show according to the best of your recollection that the actual landings of Alaska sockeye North American sockeye in 1989 exceeded all years in the 80s?
- (7) A That's correct
- (8) Q Now last few questions about farmed salmon
- (9) A About what?
- (10) Q Farmed salmon?
- (11) A Yes uh huh
- (12) Q You wrote did you not sir in 1989 you published in 1989 in an article that in aggregate terms it's difficult to avoid the conclusion that farmed salmon must either moderate price increases or actually cut real prices for domestically harvested wild salmon?
- (13) A That's in markets where they are directly affected that's correct In principal - principal area for the United States was in the market for troll caught coho and chinook salmon for which the farmed Atlantic salmon are a pretty fair substitute
- (14) The other market in which there would have been a much greater impact was the European market where the bulk of the

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- (1) European farmed salmon went It did not get into the Japanese market
- (2) Q One second sir try to speed this up Let me show you - well you have it up there I believe DX2802 sir
- (3) A DX20 -
- (4) Q 2802
- (5) MR LYNCH Your Honor I think I've got five or so minutes I'm trying to -
- (6) BY MR LYNCH
- (7) Q Do you recognize Exhibit 2802?
- (8) A Yes I do
- (9) Q And that's a report that the general accounting office of the United States prepared on price factors affecting Bristol Bay sockeye salmon?
- (10) A Yes it is
- (11) Q And is it a fact that in studying Bristol Bay prices the general accounting office concluded that it was in part the competitive importance of farmed salmon in the Japanese market
- (12) that explained the decline in prices beginning in 1989?
- (13) A That confirms my opinion that I would have expressed that this was not a very good report It was sort of a quickie job and I think it was not a carefully done study and I would disagree with that conclusion
- (14) I think it simply cannot follow that in 1989 farmed salmon getting in there mostly coho and amounting to something like

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- (1) seven or eight percent of the total imports would have had that kind of an impact
- (2) Q Would you turn sir to Exhibit DX2805 that's for identification?
- (3) A Yes
- (4) Q Do you recognize Exhibit 2805 sir?
- (5) A Yes I do
- (6) Q Is that your final report sir in the Glacier Bay case?
- (7) A I believe it is
- (8) Q Would you turn to page 12?
- (9) A Right
- (10) Q Okay You wrote this report in October of 1990 did you not sir?
- (11) A Well it was written yes just prior to that time
- (12) Q So just prior to October of 1990 correct?
- (13) A Yeah
- (14) Q In that report you said the presence of pen reared salmon parenthesis primarily Atlantic salmon in the world market recently has appeared to have significant influence on salmon prices in Japan You see that sir?
- (15) A Yes If you read the next sentence however it modifies that substantially
- (16) Q Yes Well we're not interested in '87
- (17) A No We're interested in 1989
- (18) Q Does the next sentence refer to 1989?

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- (1) A No but it -
 (2) Q Okay But sometime between 1987 correct and October of
 (3) 1990 when you wrote this you actually observed that the
 (4) presence of pen reared that is farmed salmon had had
 (5) significant influence on salmon prices in Japan correct?
 (6) A Would you repeat the question? I want to read it in
 (7) connection with what you said before Go ahead
 (8) Q The question is according to your report written in
 (9) October of 1990 farmed salmon did not have a significant
 (10) influence on price in 1987 correct?
 (11) A That s correct
 (12) Q That s the additional phrase to which you called my
 (13) attention correct sir?
 (14) A Right
 (15) Q And at the time you wrote - as of the time you wrote the
 (16) report you yourself had observed that the presence of farmed
 (17) salmon appeared to have significant influence on salmon prices
 (18) in Japan?
 (19) A The report says however during and prior to 1987 farmed
 (20) salmon comprised four percent or less of Japan s total supply
 (21) and consisted almost entirely of coho it did have an
 (22) influence on coho prices It did not in my opinion have a
 (23) general influence on an area which was producing or importing
 (24) over 300 000 tons
 (25) Q So when you said in the first sentence that you thought you

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- (1) had seen a recent significant influence you didn t mean that?
 (2) A I meant that it had an influence on certain types of
 (3) product in the Japanese market It did not affect sockeye and
 (4) that s what we re talking about
 (5) Q This is a report on the price of sockeye salmon is it not
 (6) sir?
 (7) A That s correct
 (8) Q 2802 I believe that s the right number - sorry 2805
 (9) that s your report on the price of sockeye salmon in Upper Cook
 (10) Inlet and only that subject correct sir?
 (11) A Yes
 (12) Q Now in any case as an economist you would expect that
 (13) the - whatever the effect is that an increase in the supply
 (14) of farmed salmon and by the way farmed trout would tend to
 (15) reduce prices for salmon correct?
 (16) A Again I can only state again that it depends significantly
 (17) on the quantities you re talking about and on the degree to
 (18) which the imports consist of products that are directly
 (19) competitive with other products Farmed trout to the best of
 (20) my knowledge are not a major factor influencing the price of
 (21) sockeye and the total imports of both farmed salmon and
 (22) farmed trout that were coming in were so small a part of the total
 (23) market in 87 and still in 89 they did not increase
 (24) significantly until 1990 and then again almost all of the
 (25) increase in 1990 was from Chile After 1990 the supply of

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- (1) farmed salmon coming in from Norway Sweden and other
 (2) sources
 (3) declined through 1992
 (4) Q But just to stay with this sometime between 1987 right
 (5) and October of 1990 you Dr Crutchfield observed in your
 (6) expert capacity that the presence of pen reared salmon in the
 (7) world market has recently appeared to have a significant impact
 (8) on salmon prices correct?
 (9) A But not on all salmon prices in Japan It s had a
 (10) significant influence on salmon prices elsewhere It s had a
 (11) significant influence perhaps on coho
 (12) Q But you didn t say that in your report about sockeye prices
 (13) that you were filing in another dispute relating to 1987 did
 (14) you sir?
 (15) A No did not
 (16) Q Speaking in 1990 Now I m just asking you this question
 (17) as an economist as the supply goes up of farmed salmon
 (18) would you expect that to be a factor that would cause prices to
 (19) increase for sockeye salmon?
 (20) A No
 (21) Q You would not expect that to happen correct?
 (22) A Again you can t make a flat statement about the impact of
 (23) an increase in the supply of salmon on price without reference
 (24) to what s going on on the demand side
 (25) Q Correct
 (26) A For a number of years when farmed salmon first began to

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- (1) increase rapidly demand was also increasing rapidly because
 (2) they were opening what was in effect a new market Prices held
 (3) remarkably stable for quite a while
 (4) Q But just as an economist just simple economic proposition
 (5) if you re looking at one variable in isolation an increase in
 (6) supply in and of itself would not - you would not expect that
 (7) to promote an increase in price would you?
 (8) A Not unless it were accompanied by an increase in demand
 (9) Q Which would be a separate subject a separate variable
 (10) correct?
 (11) A It might although it s possible that one could argue in
 (12) some markets the increase in availability particularly in the
 (13) East Coast of the United States the increase in the
 (14) availability of farmed salmon might have had the effect of
 (15) increasing the demand for all salmon by simply making them a
 (16) more familiar commodity otherwise the supply of wild salmon
 (17) is highly seasonal as you know
 (18) Q Let s cut to the chase In Japan from and after 1989
 (19) based on your knowledge and all of the experience that you ve
 (20) drawn on when you testify here would you expect a significant
 (21) increase in the supply of farmed coho salmon to result in
 (22) increases in the supply of sockeye salmon?
 (23) A Wouldn t have any effect -
 (24) Q I m sorry price of sockeye salmon Let me repeat the
 (25) question

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- (1) Drawing on all your economic background and experience and
 (2) looking at the Japanese market from '89 on would you expect
 (3) significant increases in the supply of farmed coho salmon to
 (4) result in increases in the price of sockeye salmon?
 (5) A Let me correct you first sir We - as we agreed to
 (6) repeatedly our study carried only through 1989 the simple
 (7) reason that our model based on first quarter prices in the
 (8) Tokyo Central Wholesale Market in 1990 and thereafter would
 (9) have included the impact of the spill itself which were - we
 (10) were trying to measure so we couldn't go beyond 1989
 (11) Otherwise the model sort of proves itself It captures both
 (12) the spill effect and any other effect that might be in the
 (13) market So we did not analyze prices beyond 1989
 (14) Q I m - I m not asking you about the model Could you
 (15) answer the question I asked you?
 (16) A Could you repeat the question?
 (17) Q Calling on your general expertise as an economist and your
 (18) knowledge of conditions in the Japanese salmon market to
 (19) which
 (20) you testified on direct would you expect that in the years
 (21) from 1989 onward significant increases in the supply of farmed
 (22) coho salmon in Japan would result in increased prices for
 (23) sockeye salmon in Japan?
 (24) A No I would not expect that
 (25) MR LYNCH Thank you sir
 (26) RECROSS EXAMINATION OF DR JAMES CRUTCHFIELD

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- (1) BY MR O NEILL
 (2) Q After talking with Mr Lynch have you changed your mind?
 (3) A No
 (4) Q Thanks You talked for a minute about the Japanese buyers
 (5) with him and with me Would you explain to the jury the role
 (6) that the oil spill fills in the negotiations between the
 (7) Japanese buyers and the Alaska fish processors?
 (8) A Yes I believe strongly that the spill which did
 (9) constitute the major out of market impact that could possibly
 (10) have been expected on the salmon market as a whole had the
 (11) effect of tilting the bargaining process very very strongly in
 (12) favor offer the buyer He had a weapon in his hand the market
 (13) was uncertain There was no way of knowing whether or not the
 (14) kind of consumer reaction that had resulted from widespread
 (15) knowledge of the spill would result in a situation in which
 (16) they might be caught with some very expensive inventory that
 (17) would prove to be unsellable or sellable only at reduced
 (18) prices
 (19) These dealers operate on relatively narrow margins
 (20) processor and the trader above him They cannot in holding
 (21) inventory bear the full risk of that degree of uncertainty
 (22) This was the reaction we found in the Glacier Bay case was the
 (23) reaction we found in the Braer case and the Shell case
 (24) Q And in point of fact with regard to sockeye prices in
 (25) Alaska fisheries what happened?

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- (1) A We got a sharp decline in prices ex vessel prices to
 (2) fishermen
 (3) Q And that happened in the Bristol Bay sockeye fishery?
 (4) A Yes it did
 (5) Q And it happened indeed in every major Alaska sockeye
 (6) salmon fishery?
 (7) A It did
 (8) Q And with regard to the one that we've been talking about
 (9) specifically the Upper Cook Inlet sockeye man fishery -
 (10) A Yes
 (11) Q - does this depict in fact the average ex vessel prices of
 (12) sockeye salmon in Upper Cook Inlet Plaintiffs Exhibit 739?
 (13) A Yes it does
 (14) Q From 1983 through 1988 the price had gone up
 (15) continuously
 (16) hadn't it?
 (17) A Yes
 (18) Q What happened in 1989?
 (19) A In 1989 it plunged very sharply
 (20) Q And in addition to modeling we took a look at a couple of
 (21) other factors You took a look at a lot of other factors
 (22) didn't you?
 (23) A Yes
 (24) Q And I put up on the screen Plaintiffs Exhibit 420 which
 (25) is in evidence which deals with monthly retail prices of
 (26) sockeye salmon in 15 Japanese cities And what does that
 (27) show

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- (1) us?
 (2) A Showed us that prices were continuing to increase during
 (3) the first part of the first quarter of 1989 They dropped
 (4) although again that chart is misleading in the sense that it
 (5) shows only the top of the prices If you extend it down to the
 (6) bottom so that it starts at zero it'll show that the decline
 (7) in prices after the spill at retail was something less than ten
 (8) percent It did not carry through It went on at that level
 (9) for almost three years thereafter The implication we drew
 (10) from that was that there was no collapse in the retail market
 (11) in Japan
 (12) Q Generally?
 (13) A Generally
 (14) Q And we took a look at the Tokyo Central Wholesale Market?
 (15) A Correct And again the importance to us was the fact
 (16) that the Tokyo wholesale market looked good for sockeye and
 (17) was
 (18) reported as such during the first quarter and it wasn't until
 (19) well after that that the price began to drop off sharply
 (20) beginning in May
 (21) Q And it did drop off sharply?
 (22) A It did indeed
 (23) Q And you as a result of your studies of the Glacier Bay
 (24) spill and the Braer spill and 50 years of - 40 to 50 years of
 (25) experience you would have expected that because of the oil
 (26) spill?

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- (1) A It was a major factor certainly
- (2) Q And with regard to the model that you designed with
- (3) Mr Freeberg which is seen on Plaintiffs Exhibit 431 and
- (4) this is that model the relationship between the first quarter
- (5) Tokyo wholesale market price and the ex vessel price the
- (6) fisherman price for sockeye salmon it is a tight fit
- (7) throughout the model until the year of the spill isn't that
- (8) right?
- (9) A Yes there are only deviations you could discern in 1983
- (10) carrying on from the impact of the botulism thing at the end of
- (11) 1981 and the 1987 episode when it dipped but in neither case
- (12) there did it go outside the coefficient of determination
- (13) Only in the case of 1959 did it simply break well below -
- (14) Q 1989?
- (15) A 1989 excuse me did it break below - significantly below
- (16) the level that the model would have predicted
- (17) Q And what does that teach us?
- (18) A I'm sorry?
- (19) Q And what does that teach us?
- (20) A It taught us that certainly the oil spill had a major extra
- (21) market impact incidentally to test the validity of our
- (22) concept we also ran the model with raw data exactly nominal
- (23) prices in Tokyo wholesale market the nominal exchange rate
- (24) not adjusted and the nominal price
- (25) MR LYNCH Your Honor may we approach?

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- (1) (At side bar off the record)
- (2) BY MR O NEILL
- (3) Q Tell us what you were going to say on this subject and then
- (4) I have two or three more questions Go ahead and finish
- (5) A Yes I was anxious to see if running the model without any
- (6) of the adjustments we talked about if our basic assumption
- (7) that the Tokyo central market was the prime determiner of
- (8) ex vessel prices in Upper Cook Inlet it's the only place the
- (9) stuff is marketed it would have to be
- (10) When we ran the raw data the coefficient of determination
- (11) dropped from 96 percent to 92 percent with no adjustments of
- (12) any kind That's a very high level of determination for the
- (13) model
- (14) The predicted price dropped by less than a cent when we
- (15) used the unadjusted figures so we felt very strongly that the
- (16) basic assumption on which we were going that the single
- (17) market
- (18) to which the bulk of which this product flows is bound to have
- (19) the primary determining factor on prices ex vessel was
- (20) justified
- (21) Q Now when you and Mr Lynch were talking about you are
- (22) here
- (23) primarily to talk about the impact whether the spill had a
- (24) price impact or not the fact of the price drop as opposed to
- (25) measuring the price but the exhibit does show from where I put
- (26) all this red stuff where the price drop was doesn't it?
- (27) A Yes it does

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- (1) Q And it was about 85 cents a pound?
- (2) A 83 cents
- (3) Q 83 cents a pound And my last question is - deals with
- (4) farmed salmon and that is would you explain to the jury why
- (5) farmed salmon is not an explanation for what happened?
- (6) A My point that I wanted to emphasize to the jury is the fact
- (7) that the market for farmed salmon is a segmented market
- (8) geographically It's a very important factor in Europe where
- (9) it provided most of the salmon There's very little wild
- (10) salmon available there except some that's imported from the
- (11) states and Canada In Japan the figures are there very
- (12) clearly The amount of farmed salmon imported into Japan was
- (13) increasing It increased in 1989 almost entirely in coho
- (14) which is only an indirect competitor with sockeye
- (15) The increase in farmed Atlantic was very small and since
- (16) the time 19 - 1989 I looked at the more recent figures the
- (17) imports of farmed salmon into the Japanese market have
- (18) declined with the sole exception of Chile and a small
- (19) amount - very small amount less than a thousand tons from
- (20) New Zealand It apparently didn't hold
- (21) Q After years of increased sockeye salmon prices out of the
- (22) Inlet why did they crash in 89?
- (23) A Well the major factor in that crash was again a shift in
- (24) the bargaining position that always involves a good deal of
- (25) latitude one way or the other and that was certainly due to

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- (1) the impact of the uncertainty caused by the spill
- (2) MR O NEILL I have no further questions Thank you
- (3) Doctor
- (4) THE COURT Thank you sir You may step down
- (5) MR O NEILL Plaintiffs call Rob Mendelsohn
- (6) THE WITNESS Mr Lynch do you want your book back?
- (7) MR O NEILL I got it
- (8) THE CLERK Would you raise your right hand please
- (9) sir?
- (10) (The Witness Is Sworn)
- (11) THE CLERK Please be seated For the record sir
- (12) state your full name give us your address and spell your last
- (13) name please
- (14) THE WITNESS My name is Robert Mendelsohn
- (15) M E N D E L S O H N and I live at 145 Lemon Road
- (16) Woodbridge
- (17) Connecticut
- (18) DIRECT EXAMINATION OF ROBERT MENDELSON
- (19) BY MR O NEILL
- (20) Q Sir what do you do for a living?
- (21) A I'm a professor at the Yale School of forestry and
- (22) Environmental Studies
- (23) Q You're a professor of what?
- (24) A I'm a professor of natural resource economics
- (25) Q What does a professor of natural resource economics do?
- (26) A Teach and conduct research

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- (1) Q In what subject areas?
- (2) A In the general area of natural resource economics the
- (3) economics of the environment which is economics of pollution
- (4) control and in the area of valuing the environment
- (5) Q And what is Yale's school of forestry and environmental
- (6) studies?
- (7) A The school is - originally was just a forestry school but
- (8) in the last 20 years it's branched out and become a school of
- (9) environmental management
- (10) Q And do you have a specialty?
- (11) A My specialty is valuing pollution effects pollution
- (12) damages
- (13) Q Would you tell us about your education after high school?
- (14) A I have a bachelor's degree from Harvard in economics and I
- (15) have a doctorate from the Yale Economics Department in
- (16) economics
- (17) Q And what kind of courses did you take?
- (18) A In the - for my doctorate I took the standard economic
- (19) core courses which would cover microeconomics and
- (20) econometrics
- (21) Q Tell us what each of those words is?
- (22) A Microeconomics is the study of individual behavior the
- (23) behavior of consumers and firms and how individual markets
- (24) behave. Macroeconomics concerns how the whole economy
- (25) behaves and the econometrics is the techniques to actually measure
- each

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- (1) of those kind of factors
- (2) Q And that includes among other things what we've seen
- (3) dozens
- (4) of and that is regression analyses?
- (5) A That's certainly a major tool in econometrics yes
- (6) Q And did you in your doctoral program and in your studies
- (7) do work with regard to economic modeling and regression
- (8) analyses?
- (9) A Yes One of my real interests in economics is applying
- (10) economics to real problems and so I personally wanted to do
- (11) applied - what's called applied microeconomics which is to
- (12) take these tools that describe individuals and firms and apply
- (13) these problems to things that really matter to society So I
- (14) was very interested in trying to connect these tools with
- (15) what's really going on in society
- (16) Q Now I want to go over your job history if we could from
- (17) when you got your Ph.D. on okay? Could you tell us what you
- (18) did?
- (19) A After my Ph.D. I moved to Seattle and got a job as an
- (20) assistant professor at the University of Washington That's
- (21) where I first met Dr. Crutchfield We were at college together
- (22) in the economics department And then after that I spent a
- (23) year at the University of Michigan again teaching natural
- (24) resource economics and economics of pollution and then after
- (25) that in '84 I got a job at Yale as an associate professor
- where I've been for the last ten years

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- (1) Q You're now a full professor?
- (2) A I'm now a full professor yes
- (3) Q Is Dr. Crutchfield still here or -
- (4) A He's gone
- (5) Q While you were at the University of Washington did you do
- (6) work with Dr. Crutchfield?
- (7) A I didn't actually work with him directly but you know we
- (8) engaged in some research projects together on fisheries things
- (9) like that
- (10) Q Did you attend seminars that he gave with regard to
- (11) fisheries and economics?
- (12) A Yes It turns out the University of Washington is one of
- (13) the best schools in fisheries They have an excellent
- (14) fisheries school and so we - we naturally sort of got drawn
- (15) into doing the economics of fisheries So there were lots of
- (16) seminars by Dr. Crutchfield and Dr. Brown and lots of visitors
- (17) as well
- (18) Q What do you teach at the Yale School of Forestry?
- (19) A Primarily three courses I teach the course on the
- (20) economics of natural resources which is designed to show how
- (21) the - how firms and economy in general use resources use
- (22) natural resources as an input into the economy and then I
- (23) teach a course on the economics of pollution which is how
- (24) firms give back to the environment which is sort of not such a
- (25) happy exchange as all the questions about pollution control

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- (1) and how much should be controlled and exactly how much
- (2) damages
- (3) individual pollutants cause and that involves both some
- (4) regular missions just part of the normal industry as well as
- (5) accidents
- (6) Then I also teach a course on valuing the environment
- (7) which actually tries to quantify things which some people say
- (8) are unquantifiable you know trying to value the parts of the
- (9) environment that get damaged by pollution control that might
- (10) get affected by natural resource management in order to try to
- (11) bring them within the general common sense analysis that's
- (12) part
- (13) of economics
- (14) Q Okay Have you ever taught at groups of scientists
- (15) symposia?
- (16) A Numerous symposia That's been part of my career is to
- (17) give seminars in different symposia For example I just came
- (18) back from organizing a symposia in the Far East where we're
- (19) trying to get natural resource economists and environmental
- (20) economists organized so that they can become part of the
- (21) world
- (22) community and one trip that I couldn't take because I was on
- (23) standby for this case was a case in - a trip to Vienna to try
- (24) to talk about pollution control with respect to global warming
- (25) Q Do you blame me for that?
- (26) A Well it was a trade off
- (27) Q Do you do any writing in the area?
- (28) A Yes I've been working in this area for the last 15 or 16

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- (1) years and published about 40 articles on the subjects and
 (2) written about a hundred
 (3) Q Do you do any work with any government agencies?
 (4) A Yes Pretty much every agency that s had land resource
 (5) management responsibilities I ve worked for them at one time
 (6) or another U S Environmental Protection Agency National
 (7) Marine Fisheries Service U S Forest Service U S Fish &
 (8) Wildlife Service
 (9) Q Have you ever - do you do any work right now with the
 (10) Environmental Protection Agency?
 (11) A Right at the moment I m on their science advisory board
 (12) which is a board that puts together some of the top
 (13) environmental scientists and economists in the country to try
 (14) to give advice to the EPA administrator the head of the
 (15) agency about what s appropriate methodology for regulating
 (16) pollution
 (17) Q Have you ever worked with any state agencies?
 (18) A Yes At different times I ve been involved in research
 (19) projects for the states of Oregon Washington and Alaska and
 (20) Montana
 (21) Q Did any of those include fish?
 (22) A Actually a number of them did The study in Montana was
 (23) concerned about dams destroying some of their trout fisheries
 (24) The studies in Oregon and - Oregon were worried about the
 (25) trade off between recreational fishing and commercial fishing

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- (1) because it turns out there s some growing interest in having
 (2) recreational fishing and so they were competing for the same
 (3) resource with the commercial fishermen And in the case of
 (4) Washington we were concerned about forest management
 (5) techniques and what impacts those were having on fish
 (6) Q Have you done any other fisheries work?
 (7) A Well one of my students right now is studying the blue fin
 (8) tuna fishery in - off the Atlantic coast which is kind of
 (9) similar to some of the fisheries here in Alaska It s a very
 (10) high valued fishery where the fish are sent off to Japan
 (11) Q As most - or a lot of the work that you ve done been
 (12) cranking these models?
 (13) A That s one way to describe it I think of it as sort of
 (14) more of a solving mysteries about what s really going on in the
 (15) world but yes I do a lot of work where you have a very
 (16) concrete problem you use an economic theory to describe how
 (17) you d analyze it and then you use econometric techniques to
 (18) measure what s really going on
 (19) Q Have you written any books?
 (20) A I ve written one book My dissertation got turned into a
 (21) book and that concerned measuring the damages from air
 (22) pollution in coal fired power plants
 (23) Q We ve had other experts come in here who had written books
 (24) and I wonder who buys these books and do you buy them from
 (25) each other?

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- (1) A Well that s a good question Economists generally don t
 (2) turn their work into books They generally write articles and
 (3) when you write a book they all look at you kind of funny and
 (4) say why did you do that
 (5) MR O NEILL You can put those books on the snoozak
 (6) shelf I would offer Dr Mendelsohn as an expert in economics
 (7) with a specialty in quantifying the value of damages from
 (8) pollution
 (9) MR COOPER Your Honor I m not sure what that
 (10) includes but I don t believe I heard anything that had to do
 (11) with determining or predicting prices of fish much less salmon
 (12) in there That includes an offer with respect to expertise in
 (13) determining fish price he doesn t - it doesn t seem to me
 (14) like there s a foundation for that
 (15) MR O NEILL You want me to get more specific?
 (16) THE COURT Let s get a little bit more specific about
 (17) the fish side of things
 (18) BY MR O NEILL
 (19) Q With regard to modeling prices do you know how to do
 (20) that?
 (21) A Absolutely Yes
 (22) Q Would you tell us why -
 (23) A Well -
 (24) Q How did you get the expertise?
 (25) A The standard techniques in economics is talk about

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- (1) analyzing markets and how they behave so we have very
 (2) simple
 (3) models which explain both the demand side what consumers
 (4) do on
 (5) the buying and also the supply side you know how different
 (6) factors might affect supply and their interaction generates
 (7) prices
 (8) Q In the construction of these demand and supply models
 (9) which is why - specifically why we ve brought you here have
 (10) you done that in the past?
 (11) A Yes Yes In particular I ve looked at cases where
 (12) pollution has in fact affected markets I ve looked at for
 (13) example - in New Bedford for example where PCB pollution in
 (14) the harbor affected the real estate market the properties
 (15) nearby and another example I ve looked at where pollution s
 (16) affected models is a study which is just about to be published
 (17) in the American Economic Review which is sort of the premier
 (18) economics journal a study which examined how climate
 (19) change
 (20) has affected agricultural prices
 (21) Q Are the techniques that you ve used throughout your career
 (22) and with regard to these two studies the same econometric
 (23) techniques that a professor like you a scientist like you
 (24) would use in valuing fish?
 (25) A Absolutely The techniques I ve applied in this case are
 (26) standard economic procedures
 (27) Q And with regard to fish and the Alaska fish market over
 (28) the course of the last number of years have you extensively

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- (1) studied the Alaska fish market?
 (2) **A** Yes The last four years I ve spent something like 1500
 (3) hours studying the Alaska fish market so this has been a major
 (4) part of my research program for the last four years
 (5) **Q** With regard to your study of the Alaska fish markets are
 (6) the studies that you used the journals that you looked at the
 (7) information that you looked at the factors that you looked at
 (8) the kind that economists like you from the Yale School of
 (9) Forestry would traditionally look at?
 (10) **A** The techniques I ve used are in fact standard techniques
 (11) and there s nothing unusual about the kinds of work I ve been
 (12) doing in this case
 (13) **Q** With regard to the work that you bring here today the
 (14) models that you bring here today are they traditional
 (15) applications of your background in modeling to this market that
 (16) you ve studied at some great extent?
 (17) **A** Yes they are
 (18) **MR O NEILL** Renew the offer
 (19) **THE COURT** The offer as extended to Dr Mendelsohn s
 (20) qualifications as an expert are accepted by the Court He may
 (21) testify as to pollution effects on price of fish in Alaska
 (22) **MR O NEILL** Thank you Judge
 (23) **BY MR O NEILL**
 (24) **Q** Now what were you asked to do?
 (25) **A** I was asked to examine Alaska seafood prices and determine

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- (1) whether the oil spill had an effect on those prices and if
 (2) they did what was the magnitude of the effect
 (3) **Q** And what species of salmon did you look at?
 (4) **A** The species of salmon that I examined were all five of the
 (5) major Alaska salmon species which would be sockeye first
 (6) pink chum coho and king chinook
 (7) **Q** Coho are silvers?
 (8) **A** Coho are silver yes
 (9) **Q** Just so we know
 (10) **A** Get these colors right
 (11) **Q** How much time did you spend on the project?
 (12) **A** Approximately 1500 hours
 (13) **Q** And did you reach a conclusion about the impact of the
 (14) Exxon Valdez oil spill - you also looked at herring didn t
 (15) you?
 (16) **A** That s also correct the herring and the herring roe
 (17) market
 (18) **Q** Did you reach a conclusion about the impact of the Exxon
 (19) Valdez oil spill on salmon and herring prices?
 (20) **A** Yes
 (21) **Q** What conclusions did you reach?
 (22) **A** I ve concluded that the Exxon Valdez spill damaged the
 (23) reputation or damaged the image of high quality fish coming
 (24) out
 (25) of the Alaska seafood market and this resulted in lower prices
 for those fish from 1989 through 1991

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- (1) **Q** And that included red pink chum and kings?
 (2) **A** That s correct The salmon that I ve concluded have been
 (3) damaged would be the red sockeye the king the chinook
 (4) the - not the coho the pink and the -
 (5) **Q** Chums?
 (6) **A** The chums yes thank you
 (7) **Q** And with regard to silvers you were unable to reach a
 (8) conclusion on silvers?
 (9) **A** That s right In my opinion the evidence was mixed with
 (10) respect to silver and to be conservative I ve assumed that
 (11) there s no effect there
 (12) **Q** How about herring?
 (13) **A** It - it s clear that there s effects in the herring roe
 (14) market and roe on kelp market both
 (15) **Q** Those effects are the result of the Exxon Valdez oil spill?
 (16) **A** That s correct that the Exxon Valdez oil spill has
 (17) affected those markets has limited the premium that used to be
 (18) associated with those products and has resulted in lower
 (19) prices
 (20) **Q** How did you go about studying the effect of the Exxon
 (21) Valdez oil spill on the price of Alaskan seafood?
 (22) **A** Well the first step was to look at exactly what the prices
 (23) did over time so that was my first line of attack
 (24) **Q** And what prices did you use?
 (25) **A** Well the question that - that s on hand is what s

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- (1) happened to the price that the fishermen have received so
 (2) rather than going to later prices prices that are further down
 (3) in the market chain I examined exactly the prices the
 (4) fishermen were getting the ex vessel prices
 (5) **Q** I have pulled a boo boo but we had some preadmits for
 (6) today that I should have done before the doctor - I m going to
 (7) put you over in suspended animation if I could for a second
 (8) and do the preadmits because it ll save some time with your
 (9) testimony
 (10) **MR O NEILL** For the record plaintiffs would offer
 (11) the following exhibits Exhibits - Plaintiffs Exhibits 518
 (12) 519 520 522 523 524 3645 3647 Exhibit 430 530 531
 (13) Exhibits 439 440 441 442 443 444 445 446 447 448 449
 (14) 450 451 454 455 456 457 458 459 460 780 781 783
 (15) 784 786 789 790 792 793 6004 6005 6006 6007
 (16) (Exhibits 518 519 520 522 523 524 3645 3647 430
 (17) 530 531 439 440 441 442 443 444 445 446 447 448
 (18) 449 450 451 454 455 456 457 458 459 460 780 781
 (19) 783 784 786 789 790 792 793 6004 6005 6006 6007
 (20) offered)
 (21) **THE COURT** Are there objections to any of these
 (22) exhibits?
 (23) **MR COOPER** Your Honor at least insofar as those
 (24) exhibits concern this witness those are agreed upon as
 (25) preadmitted

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- (1) THE COURT The exhibits just announced by Mr O Neill
 (2) are admitted
 (3) (Exhibits 518 519 520 522 523 524 3645 3647 430
 (4) 530 531 439 440 441 442 443 444 445 446 447 448
 (5) 449 450 451 454 455 456 457 458 459 460 780 781
 (6) 783 784 786 789 790 792 793 6004 6005 6006 6007
 (7) received)
 (8) MR O NEILL Thank you Judge
 (9) BY MR O NEILL
 (10) Q Let s - if we could take a look at Exhibit 440 what does
 (11) Exhibit 440 show us?
 (12) A Well as you can see from looking at this exhibit the
 (13) prices of - the ex vessel prices of sockeye have gone through
 (14) a number of fluctuations The most important factor is that
 (15) for a long time prices have been in an upward trend through the
 (16) 80s but suddenly in 89 they ve taken a precipitous drop
 (17) and that drop has continued through 91
 (18) Q Now these prices on Exhibit 440 are the actual ex vessel
 (19) prices for those years?
 (20) A Yeah this is what the fishermen were actually paid This
 (21) is their annual payment the average salary for the year
 (22) Q For the sake of clarity could you draw a red circle if
 (23) you can get that thing up there around the 88/ 89 time
 (24) period?
 (25) A Well this is 88 which was a peak year and this is 89

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- (1) after the spill So these are year end prices
 (2) Q Now I want to take a look if we could briefly at what
 (3) happens - that s for sockeye red salmon?
 (4) A Yes
 (5) Q Let s take a look at pink salmon and see what happens with
 (6) regard to pink salmon and we re going to look at Exhibit 441
 (7) with regard to pink salmon and what do we see on Exhibit 441?
 (8) A Well the same kind of pattern The prices rose in the
 (9) late 80s but then following 88 again being a peak year and
 (10) then following that there was an abrupt reduction in prices in
 (11) 89 The price reduction was continued again through 91
 (12) Q So in 1988 the pink salmon price was above - or about
 (13) eighty cents a pound and by 1991 it s below 20 cents a pound?
 (14) A That s correct
 (15) Q What do we see with regard to king salmon prices?
 (16) A Again you can see that in the 80s there was an increase
 (17) in prices and then when we reached 88 there s again a peak
 (18) and then again following it back there s an abrupt decline
 (19) and the prices at this point just stay at that level
 (20) Q And on Exhibit 790 we have chum salmon
 (21) A And again you see the same pattern that in the 80s the
 (22) prices were rising rapidly They reached a peak in 88 and
 (23) abruptly fell in 89 and then again slightly more in 91
 (24) Q Now I m going to put up silver because as we proceed
 (25) we re going to talk about silvers but just to remind

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- (1) everybody you could not come to a good conclusion on
 silvers?
 (2) A That s correct On coho I was unable to conclude that the
 (3) oil spill was in fact the culprit for this
 (4) Q And what -
 (5) A Again you see the same kind of effect that the prices rise
 (6) to 88 reached a peak and then fall abruptly in 89 and stay
 (7) down in 89
 (8) Q Let s take if we could a look also at the two
 (9) predevelopment herring products sac roe herring and herring
 (10) roe spawned on kelp and we re going to take a look at Exhibit
 (11) 458 which deals with sac roe herring and tell me what we see
 (12) with regard to sac roe hearing?
 (13) A Sac roe herring you can see this is a shorter time line
 (14) This is slightly different than the salmon We didn t have
 (15) data going as far back so this is entirely the 80s and what
 (16) you can see in general the prices were rising again they
 (17) reached a peak in 88 and then abruptly fell in 89 and stayed
 (18) low
 (19) Q And herring roe spawned on kelp which is Exhibit 457 what
 (20) do we see there?
 (21) A Again you see the same pattern that prices were rising
 (22) through the 80s reached a peak again in 88 and then fell
 (23) abruptly in 89 and in this case the prices then recovered
 (24) somewhat
 (25) Q Now I want to talk about red salmon and just so everybody

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- (1) knows where we re going we re going to talk primarily about
 (2) red and pink salmon because they re the two major species so
 (3) we ll focus the discussion on those and we ll talk briefly
 (4) about the other species
 (5) If you want to in fact model red salmon as an
 (6) econometrician would like to model red salmon you d take a
 (7) look at the factors that affect salmon prices That s a
 (8) correct statement isn t it?
 (9) A That s right because generally what we want to know - now
 (10) we know there was an abrupt decline these prices in 89 and
 (11) what we re trying to determine it was what caused it Was this
 (12) a market effect was this caused by normal market factors or
 (13) was this caused by the oil spill
 (14) So what we try to do is build a model which would actually
 (15) quantify what even of those market factors would do We want
 (16) to know was it that the market factors would lower prices but
 (17) how much would they lower prices That s the important
 (18) question here The question here the quantifying things did
 (19) the forces forcing prices down enough to explain that big
 (20) gap in prices or did they only drop just slightly and that big
 (21) gap is actually due to something else not just market forces
 (22) Q And Exhibit 454 which is in evidence is what?
 (23) A That s the description of the factors which I included
 (24) examined in the model So there s two lists there the first
 (25) list includes the variables which are actually included in the

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- (1) model that you see in our exhibits and the second list
 (2) considers variables which we had then considered just to see if
 (3) they were important
 (4) Q I'll bring this up on the TV screen too so everybody can
 (5) get a good look at it
 (6) Now the top five on the chart include the amount of Alaska
 (7) king salmon the quantity of king salmon is that - what
 (8) quantity are we talking about?
 (9) A That's the quantity that was harvested in each year in
 (10) Alaska
 (11) Q And the quantity of Alaskan red or sockeye salmon?
 (12) A Yes Same
 (13) Q The real interest rate in Japan what is that?
 (14) A That's the - the interest rate that a person who's holding
 (15) that - those inventories over the year would actually face
 (16) So it gives you a sense of the cost of what the person's going
 (17) to face for holding the inventory for the entire year
 (18) Q The amount of salmon harvested in the world that's a
 (19) factor you looked at?
 (20) A Yes definitely included that that includes the amount of
 (21) farmed salmon harvested in the world
 (22) Q And the exchange rate with Japan?
 (23) A Yes that's the exchange rate the way you trade yen with
 (24) dollars it's the number of dollars you get back for giving up
 (25) a unit of yen

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- (1) Q These are factors after looking at the - all of the
 (2) factors on the exhibit that you found to have a relationship
 (3) with the price of red salmon?
 (4) A Yes Those turned out to be statistically most important
 (5) Q And all of these other 26 factors that include income in
 (6) the United States how much fish people are eating in the U S
 (7) nominal interest rates in the United States all of these other
 (8) factors you took a look at?
 (9) A Yes We had explored each of the factors that are listed
 (10) on the other list and that includes all the other sources of
 (11) salmon which we get the different species that includes other
 (12) sources in the sense of other places that were producing
 (13) salmon So it's a very extensive list of other variables which
 (14) could have affected the market so we wanted to make sure that
 (15) we tested them and measured whether they were important or
 (16) not
 (17) Q Now the ones that you found to be important is it an
 (18) oversimplification to say that you found a relationship between
 (19) sockeye prices and these five factors over a period of time?
 (20) A Yes You'd expect in terms of the ex vessel prices that
 (21) the - the amount of sockeye was going to be important because
 (22) it tells you how much supply there is and that it's possible
 (23) that other species of salmon might be important which is why
 (24) the king salmon variable is included and then the real
 (25) interest rate is part of why the cost of holding the thing so

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- (1) that's going to be important to the Japanese buyer and the
 (2) amount of farmed salmon people have claimed that was going
 (3) to
 (4) be very important so I thought it was essential to include
 (5) that variable in the model
 (6) And then the exchange rate is going to be important
 (7) because where the sockeye is going to be exported primarily is
 (8) Japan so it depends on from a Japanese point of view how
 (9) many dollars you - he can get for his yen is going to be very
 (10) important to them in terms of what kind of price they're
 (11) willing to pay
 (12) Q With regard to the factors you found to have a predicting
 (13) relationship you put those into a mathematical model you take
 (14) the data on these sources and put them into a mathematical
 (15) model?
 (16) A That's right As the analyst I get to decide which
 (17) variables go into a particular model and then the model
 (18) looking at the actual empirical data tells me how important
 (19) those factors are and what direction the effect is So it's
 (20) the empirical data which determines the size of the factors
 (21) not myself
 (22) Q And you go to a variety of different official data sources
 (23) for this information and you crank them through a computer?
 (24) A Yes that's one way to describe it We collected the data
 (25) from the - as you pointed out the official sources including
 the sources for king salmon quantities and prices and then

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- (1) official statistics about exchange rates between the two
 (2) countries and inflation rates and things like that And we
 (3) double checked all those numbers just to make sure that they
 (4) were exactly correct and then we introduced all that data
 (5) which includes data from 1964 all the way through 1991 We
 (6) introduced that into a statistical analysis and tried to
 (7) determine - and the model the statistical analysis determines
 (8) what each of those variables does to prices that is how much
 (9) does each one contribute to the prices we observe over time
 (10) Q I'm going to leave this board up but I'm going to pull up
 (11) on the TV Exhibit 444 which is in evidence Do I have - I've
 (12) got a board I'll use a board Changed my mind I'll put up
 (13) the board
 (14) And what is this Exhibit 444?
 (15) A Now what the exhibit shows - this is a very important
 (16) exhibit What this exhibit shows is what the model predicts
 (17) would happen and what actually did happen and if you look at
 (18) the data points from 1964 through 1988 the orange line shows
 (19) you what the model predicts would happen As you can see
 (20) the
 (21) orange line actually tracks actual prices fairly closely so
 (22) the model normal market factors are explaining a lot of the
 (23) variation that you observe in the actual prices up through
 (24) 1988
 (25) In 1989 through '91 we used the relationships that the
 model has predicted from all those previous years and we

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- (1) predict what those prices would have been if the spill had not
 (2) occurred that is just looking at the market factors alone
 (3) what would the prices have looked like and what this model
 (4) predicts is that the prices would have in fact increased over
 (5) this time period And if you look at 81 90 91 they would
 (6) have actually slightly increased over the 1988 price In fact
 (7) if you look at actual prices actual prices took a sharp drop
 (8) In my opinion the difference between these two is the
 (9) taint effect It s the effect the oil spill had on sockeye
 (10) prices
 (11) Q I ve going to parse that out into three parts The first
 (12) is up to 1988 Let s just talk for a minute about up to 1988
 (13) Up to 1988 the orange line is what the model predicts and
 (14) the black line is the actual price and you get a good fit?
 (15) A Yes
 (16) Q And is the fit that you get here significant to somebody in
 (17) your business?
 (18) A Yes It s saying that this model is - the market factors
 (19) included in this model actually are capturing a lot of the
 (20) variation that you observed happening in the marketplace up
 (21) until 1988 through 1988
 (22) Q Okay The model predicts that the prices would continue on
 (23) the same general incline that they had been on since 1983 for
 (24) 1989 1990 and 91 That s a correct statement isn t it?
 (25) A That s correct

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- (1) Q But in fact there is a crash which we ve already talked
 (2) about in red salmon or sockeye prices?
 (3) A That s correct
 (4) Q So that tells you that something s rotten in Denmark or
 (5) Alaska?
 (6) A Something other than normal market factors has happened
 (7) and it happened in 89 That s what it tells you
 (8) Q And you ve heard Dr Crutchfield s testimony about the
 (9) history of these kinds of things Is this kind of effect in
 (10) your view consistent with an environmental disaster like the
 (11) Exxon Valdez oil spill would have on the price of a product
 (12) like red salmon?
 (13) A Absolutely
 (14) Q Is it your opinion that the drop in price between the
 (15) predicted value and the actual value that the Exxon Valdez oil
 (16) spill was the major contributing factor to that price drop?
 (17) A That is my opinion
 (18) MR O NEILL Can we take a break now Judge?
 (19) THE COURT We ll take our recess at this time ladies
 (20) and gentlemen We ll be in recess for 15 minutes
 (21) (Jury out at 9 58)
 (22) (Recess from 9 58 a m to 10 16 a m)
 (23) (Jury in at 10 16)
 (24) MR O NEILL Thank you Judge
 (25) BY MR O NEILL

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- (1) Q Now we were talking about Plaintiffs 444 when we took our
 (2) break and you used an expression in describing this here the
 (3) effect the red effect you called it the taint effect?
 (4) A That s correct
 (5) Q Would you explain that to us?
 (6) A What that - what this graph shows what that red area
 (7) shows is that if you look at all the market factors prices
 (8) should have increased but in fact they did not And the
 (9) question is what could have caused that and it s pretty clear
 (10) from past evidence that from very small spills even very small
 (11) spills have a subtle affect on prices So we have experience
 (12) with the Glacier Bay spill we have some experience with the
 (13) spill in the Shetland Islands we have some experience with the
 (14) Torrey Canyon spill In all those cases we have some evidence
 (15) that following the spill there was a price effect and the
 (16) price effect - I m calling it taint
 (17) And in the case of sockeye my theory is that the reason
 (18) why you see such a big taint is that this is a very high
 (19) premium product This is the fillet mignon of fish This is
 (20) one of the top products and top types of seafood in Japan And
 (21) when you find out - when there s a threat in the consumers
 (22) minds risks small risks even that perhaps there s something
 (23) wrong with this fish it dramatically affects that premium and
 (24) that premium gets wiped out And that red area is the taint
 (25) effect the effect of that premium being eliminated

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- (1) Q The premium was eliminated in your opinion as a result of
 (2) the Exxon Valdez oil spill?
 (3) A Exactly
 (4) Q You mentioned the Torrey Canyon spill That s a new spill
 (5) here in the room It isn t for the world but it is for this
 (6) room When and where did the Torrey Canyon spill occur?
 (7) A I think it was in the 70s It occurred off the coast of
 (8) France close to England and the evidence that people had
 (9) following that spill the prices for catch French catch
 (10) actually fell even in places where there was no spill no
 (11) effect no direct effect people observed for the year
 (12) following that spill that the prices had in fact fallen
 (13) Q I m going to call up Plaintiffs Exhibit 443 the chart
 (14) and would you explain for us the relevance of Exhibit 443 to
 (15) what we re all doing here today?
 (16) A One of the questions is why does - why do you see prices
 (17) increasing during the 80s and one of - one of the strongest
 (18) factors that caused those prices to increase in the 80s was
 (19) Japanese buying power was the ability of the Japanese to pay
 (20) a
 (21) higher price because they had both higher incomes their real
 (22) incomes were going up and also because the yen relative to
 (23) the
 (24) dollar for whatever yen income they had they could buy more
 (25) dollars they could get more dollars for it So their ability
 (26) to buy went up dramatically
 (27) And one of the things you expect to see if you start

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- (1) getting wealthier is you re going to shift more of your income
 (2) into buying high quality products So that s directly affected
 (3) the sockeye market because this is one of the high quality
 (4) markets Japan can buy This stimulated the prices that you see
 (5) in the 80s and should have kept prices up
 (6) Q So this the buying power of the Japanese is another
 (7) indication that this is a result of the oil spill?
 (8) A That s right because the factors which were motivating
 (9) prices to increase in the 80s they re still there there s no
 (10) reason why the prices should have fallen then
 (11) Q Now I want to talk for a minute about pink salmon and I m
 (12) going to pull up on the screen Exhibit 439 And what is
 (13) Exhibit 439?
 (14) A Exhibit 439 is exactly like the exhibit you saw before with
 (15) sockeye except that this particular one is explaining what
 (16) factors were included in the pink model the model of the pink
 (17) salmon market Again it s an ex vessel market One of the
 (18) factor - there s two factors in here included that were not in
 (19) the previous model that turned out to be important in the pink
 (20) model One of them is canned pink salmon because it turns
 (21) out
 (22) most of pink salmon are canned so when you think of canned
 (23) salmon it s the pink that is the primary species that is sent
 (24) into the canning market It was important to include the
 (25) canned inventory in this model
 (26) Another factor which turned out to be important in this

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- (1) model was tuna and tuna serves as a substitute for salmon to
 (2) some degree both in the canned area and also to some degree
 (3) in
 (4) the fresh frozen area
 (5) Q So the factors on the top of the exhibit are those factors
 (6) that you looked at that had some predictive value with regard
 (7) to pink salmon?
 (8) A Yes These are the factors that turned out to be
 (9) important Once you included them in the model you could
 (10) see
 (11) that they were important
 (12) Q Let me just pull the ones that were in fact important up
 (13) Could I have control?
 (14) And the factors that did have a predictive value with
 (15) regard to pink salmon were the amount of Alaska pink salmon
 (16) the amount of Alaskan red or sockeye salmon the amount of
 (17) farmed salmon harvested in the world the United States
 (18) inventory of canned pink salmon and the United States
 (19) ex vessel
 (20) price of tuna and those were the ones that worked?
 (21) A Yes These are the factors that turned out to be important
 (22) in this market
 (23) Q And you looked at 26 other factors or studied 26 other
 (24) factors and they included such things as interest rates a
 (25) variety of inventories of other products a variety of other
 (26) harvest levels or supply levels and other kinds of economic
 (27) data and you found these other things not to have as important
 (28) a predicted value?

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- (1) A Yes We included the other factors - and I guess this is
 (2) a point we should raise with respect to all of the analyses
 (3) We included the other factors to see which ones were most
 (4) important We also wanted to include them to see if what we
 (5) were predicting that oil spill effect the taint effect would
 (6) be sensitive to whether you included these variables or not
 (7) What we found were these variables generally were not very
 (8) significant and further the taint effect was still there even
 (9) when they were put into the market
 (10) Q I m going to place in front of the jury and also bring up
 (11) onto the screen Plaintiffs Exhibit 445 And what is
 (12) Plaintiffs Exhibit 445 Doctor?
 (13) A This is again a description of what the actual prices were
 (14) that s the black line and what the model predicts the prices
 (15) would have been and that s the orange line And again it s
 (16) the same - you see the same patterns as we saw before in the
 (17) red salmon prior to the spill The model does a fairly good
 (18) job of predicting the actual observed variations in prices
 (19) and that once you reach the spill the model in this particular
 (20) case predicts the prices would have gone down but would not
 (21) have gone down anywhere nearly as much as the spill - as
 (22) actual prices did go down and that difference again is the
 (23) taint effect
 (24) Q This kind of model is exactly the kind of model we talked
 (25) about a few minutes ago with regard to red salmon?

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- (1) A Yes But one of the things that I guess is important to
 (2) note is that the model does predict prices would fall in this
 (3) particular market
 (4) Q Let s - okay Let s talk about this just for a second
 (5) because Dr Crutchfield talked at great length about the red
 (6) salmon market and the red salmon are fresh frozen and go to
 (7) Japan The pinks go in a different direction don t they?
 (8) A Yes They re primarily canned and sold in the United
 (9) States and Europe and though to some extent there s an
 (10) increasing amount of them being sent to Japan
 (11) Q But the fact that a good amount of them are sold in the
 (12) United States and Europe is the reason you look at different
 (13) factors in setting up a model?
 (14) A Exactly That s why each species is different because you
 (15) have to be careful not to mix the species together They re
 (16) not the same
 (17) Q We saw the model predict that red salmon prices would go
 (18) up in this case to a different market a market depicts a
 (19) modest decline in pink salmon prices?
 (20) A That s right
 (21) Q But not the precipitous decline that happened?
 (22) A That s right And the reason why that s really important
 (23) is it emphasizes how important it is to quantify these effects
 (24) because it s clear that the market did cause prices to go down
 (25) but that doesn t mean there was no taint effect This

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- (1) particular case prices went down but not by very much
 (2) because of market values so this business of quantifying the
 (3) size of these effects is critical to this - to determining
 (4) whether there's taint effect or not
 (5) Q And Exhibit 7 81 which is in evidence are the factors
 (6) that you looked at with regard to kings isn't that correct?
 (7) A That's correct
 (8) Q And what were the factors that you investigated that made a
 (9) difference?
 (10) A Again that these are very similar to the cases we had
 (11) before especially examples we just had included the king
 (12) salmon included the exchange rate with Japan included the
 (13) inventory of canned king salmon and the prices of tuna
 (14) Q And you looked at a variety of other factors for instance
 (15) kings and they're listed on Exhibit 781 just like you did for
 (16) the other species?
 (17) A Yes Pretty much these are exactly the same factors we saw
 (18) before the same factors that are both supplies from other
 (19) sources other kinds of species and other kinds of economic
 (20) factors
 (21) Q And on Exhibit 780 we take a look at factors with regard
 (22) to chum salmon? And the factors that I've blown up on the
 (23) screen are the factors again that made a difference?
 (24) A Yes
 (25) Q What are they?

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- (1) A They're quantity of chum salmon the amount of red sockeye
 (2) salmon they can act interchangeably sometimes they can take
 (3) substitute to a partial degree the exchange rate with Japan
 (4) the ex vessel price of tuna and in this case the income of the
 (5) United States
 (6) Q And with regard to king salmon I'm going to pull up on the
 (7) screen Exhibit 792 and is that a graphical depiction of the
 (8) model with regard to king salmon?
 (9) A Yes Again it's the same pattern as we saw before that
 (10) as you go through before 1988 you see these variations in
 (11) prices and you see the actual prices are fairly well captured
 (12) by the model so the model - the market factors are causing a
 (13) lot of the variations in prices you see through 1988 And
 (14) again in '89 through '91 you see that market factors would have
 (15) caused prices to decline but in fact actual prices declined
 (16) far more than the market predicted - the model predicted the
 (17) market prices would cost That difference once again is the
 (18) taint effect
 (19) Q And Exhibit 793 is a similar model with regard to chum
 (20) salmon?
 (21) A Exactly the same kind of results The model can predict a
 (22) lot of the variation in prices you see up through 1988 and then
 (23) in 1989 Again the model predicts a slight decline in prices
 (24) but nowhere near as much as actual prices declined
 (25) Q Now Doctor in building these models like the one depicted

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- (1) in Exhibit 444 are there statistical tests that you run on the
 (2) models to make sure that what the models are telling you make
 (3) mathematical sense?
 (4) A Yes There's a number of different tests that you could
 (5) run One test you could run is to see if the difference
 (6) between what the actual prices occurred and what the
 (7) predicted
 (8) price whether they tend to be very close and if they - if it
 (9) turned out there was lots of variation the model couldn't
 (10) explain then you could make a statistical test to see how well
 (11) the model was explaining overall
 (12) And in this case as you can see the model does a very
 (13) good job of explaining the fluctuations you see in observed
 (14) prices so one of the statistical tests you can do is an R
 (15) squared test That tests how close the predicted prices fit
 (16) the actual ones And in this model it's very close
 (17) Q And indeed for the species that - the four species that
 (18) we've looked at reds kings chums and pinks the statistical
 (19) tests that you ran gave your opinion confidence?
 (20) A That's right I have confidence in this opinion for two
 (21) reasons One is that the model fit very closely and two
 (22) that the size of that taint effect is so large and is so
 (23) consistent that the chances that that was just an accident or
 (24) chance is very very small
 (25) Q And it's consistent with the phenomenon that we've seen in
 (26) other oil spills?

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- (1) A Yes it is
 (2) Q Now Exhibit 430 is an exhibit that we used with Dr
 (3) Crutchfield but it shows a precipitous decline in sockeye
 (4) salmon throughout Alaska including Bristol Bay southeast
 (5) plus the four oil spilled areas?
 (6) A That's correct
 (7) Q Is the fact that there was a precipitous decline in Bristol
 (8) Bay and southeast consistent or inconsistent with what you've
 (9) done here?
 (10) A Well my model is - actually examines Alaska wide prices
 (11) and from what little we can understand of the consumer market
 (12) in Japan consumers there do not know where the salmon come
 (13) from They don't know which area the salmon come from They
 (14) just know that this is sockeye and so whatever has happened
 (15) to
 (16) the sockeye market it's going to happen to every one of these
 (17) areas
 (18) Q So if there's an impact in Prince William Sound Kodiak
 (19) Chignik and Upper Cook Inlet on sockeye the market perceives
 (20) that as an Alaska wide impact?
 (21) A That's correct
 (22) Q For the calculations though that we're going to make
 (23) today we're just doing a calculation for the oil spill
 (24) impacted areas?
 (25) A That's right This analysis the analysis we've shown to
 (26) date shows that in fact the price effect occurred throughout

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- (1) the entire state but the damages that we re actually going to
 (2) calculate are only for the oil spilled areas
 (3) Q Now did you take a look at the factors affecting the
 (4) prices for sac roe herring?
 (5) A Yes And the exhibit you show explains the factors which
 (6) we included in the model and again the additional factors which
 (7) we tested
 (8) Q And I put up Exhibit 459 on the screen and have it also up
 (9) on the board in front of the jury and with regard to sac roe
 (10) herring what figures or what factors did you find were
 (11) significant?
 (12) A Well the two factors that turned out to be significant in
 (13) the herring roe model was the inventory in Japan of the herring
 (14) roe and the income in Japan in U S dollars that is the
 (15) buying power the Japanese buying power
 (16) Q Now I m going to just for a minute regress back to
 (17) salmon for a second and then we re going to come right back to
 (18) herring I want to use this as a bridge to address a specific
 (19) topic
 (20) In your salmon models and particularly in the pink salmon
 (21) model you looked at farmed salmon isn t that correct?
 (22) A That s correct
 (23) Q And you found a correlation between farmed salmon and the
 (24) affected salmon prices and it went in a direction - in what
 (25) direction?

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- (1) A It was positive It means the more farmed salmon -
 (2) according to the model the more farmed salmon you included
 (3) the higher prices would be for sockeye
 (4) Q And do you have an explanation for that?
 (5) A You would normally expect if something was acting as a
 (6) substitute that as you got - more and more of the substitute
 (7) became available that the price would go down So what we
 (8) were
 (9) expecting prices would go down it would be a negative effect
 (10) Q In fact it was a positive effect?
 (11) A That s right And one of the reasons why and the question
 (12) is why why did this model - why looking at the data does the
 (13) data tell you it s a positive effect when expectations tell
 (14) you it should be negative and one of the reasons we found was
 (15) that we didn t really expect it to be very important
 (16) We included farmed salmon because everybody was saying
 (17) farmed salmon was the cause of the price decline so it was
 (18) important to include in the model but in practice there was
 (19) not really much of a reason to expect it to be important
 (20) because as Dr Crutchfield was saying if you look at that
 (21) market the Japanese market farmed salmon was not important
 (22) in
 (23) Japan as of 1988 It accounted for less than five percent of
 (24) the salmon at that time It was all coho And so the farmed
 (25) salmon that everyone s talking about this Atlantic the
 Atlantic salmon up to that moment you know until the spill
 occurred it hadn t actually really made it into the Japanese

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- (1) market So we thought when we included it it just wasn t
 (2) going to be important but in fact it came in and it was
 (3) important and it was the wrong sign and so the question is why
 (4) could it be the wrong sign
 (5) My feeling is that the reason it s the wrong sign is that
 (6) at the same time farmed salmon - world farmed salmon was
 (7) increasing so was Japanese buying power and when you
 included
 (8) farmed salmon in this model it acts as a proxy It acts as a
 (9) representative for Japanese income And so the reason why it
 (10) had a positive effect is that Japanese buying power does have a
 (11) positive effect on the sockeye prices and putting the farmed
 (12) salmon variable in it captures so the coefficient to the
 (13) effect turns out to be positive
 (14) Q Whatever though the numbers are with regard to these
 (15) factors they are and you can t change them and the model
 (16) does predict well?
 (17) A Yes
 (18) Q And the model predicts well through 1988 and then shows
 (19) what happens with regard to the oil spill?
 (20) A That s correct
 (21) Q Now the farmed salmon issue is not an issue at all with
 (22) regard to herring is it?
 (23) A No obviously not
 (24) Q So we can take a look at herring and both do the
 (25) calculation with regard to herring but see if there is a spill

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- (1) impact on herring coming out of the same fishery that there is
 (2) a spill impact on salmon?
 (3) A Exactly
 (4) Q And that will give us if in fact there is it gives us
 (5) further confidence in the result?
 (6) A Yes It s sort of like having a chance to do seven
 (7) different experiments instead of just one sort of have seven
 (8) experiments going on because there have been seven different
 (9) fisheries have all been oiled and the question is what s
 (10) happened to them
 (11) Q And with regard to sac roe herring you took a look at the
 (12) factors listed in Exhibit 783 and with regard to roe spawned
 (13) on kelp you took a look - I m sorry the sac roe you took a
 (14) look at the factors listed in Exhibit 459 and with regard to
 (15) roe spawned on kelp factors you took a look at the factors
 (16) listed in Exhibit 783 is that a correct statement?
 (17) A Yes
 (18) Q Let s see what the results are I ve placed in front of
 (19) the jury Exhibit 456 which I ll bring up on the screen And
 (20) what does the exhibit show?
 (21) A The exhibit shows exactly the same patterns as we just saw
 (22) for the - or for salmon that is prior to 1988 The model
 (23) does have a reasonable job of capturing the small change in
 (24) prices that you see that growth in prices that you see in the
 (25) sac roe herring market and then following that predicting

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- (1) what the prices would have been the market actually predicts
 (2) that the prices would have pretty much stayed at that level
 (3) It would have stayed near the level you observed in 1988
 (4) and in fact actual prices declined very dramatically from
 (5) there
 (6) Q We get high prices before the spill and a crash in prices
 (7) after the spill?
 (8) A That's what the observed prices do but that's not what the
 (9) model predicted would have happened
 (10) Q The model predicted the prices would have remained fairly
 (11) stable?
 (12) A That's right There would have been a slight decline in
 (13) prices in 1989 but then they would have bounced back
 (14) Q The red reflects the damage to the fisherman price?
 (15) A That's right that red area reflects the size of the taint
 (16) effect
 (17) Q And you also took a look in Exhibit 455 on herring roe
 (18) spawned on kelp which is my favorite fisheries product
 (19) A I suppose you don't have to eat these fisheries to
 (20) appreciate them
 (21) Q Hope not And that again is consistent with what we've
 (22) seen with regard to the four salmon species and the other
 (23) herring species?
 (24) A Exactly You see the model tracks prices fairly closely up
 (25) until 1988 and then following that the model does predict

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- (1) prices would have declined but not nearly as much as they
 (2) actually declined and the model predicts the difference
 (3) between actual and predicted prices remained steady from
 (4) 1988
 (5) Q With regard to the price results did you study the price
 (6) in pounds for the fisheries that came out of the oiled
 (7) fisheries?
 (8) A Yes I did so I took the observed price differences The
 (9) red area measures the difference between the observed price
 (10) and
 (11) what the price should have been and I multiplied that price
 (12) difference times the quantity of fish which were caught in each
 (13) of the areas in that particular year And that results in
 (14) these damage numbers
 (15) Q And I've placed in front of the jury Plaintiffs Exhibit
 (16) Number 448 which is in evidence and it breaks it down for the
 (17) jury by year and by fishery?
 (18) A Yes So this is the red salmon fishery The red salmon
 (19) fish this is the sockeye market these are the five different
 (20) fisheries and the effects you observed in each year
 (21) Q And that number is \$370 717 000?
 (22) A That's what the aggregate is yes
 (23) Q And is this the damage to these oiled fisheries as a result
 (24) of the Exxon Valdez oil spill with regard to price?
 (25) A Yes this is the taint effect
 (26) Q And is it your opinion that this damage is a result of the

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- (1) Exxon Valdez oil spill?
 (2) A Yes it is
 (3) Q And in Exhibit 451 which I've placed in front of the jury
 (4) you do the same thing with regard to pink fish?
 (5) A Yes So in this case you're taking the reduction in the
 (6) pink prices and multiplying by the quantity of pinks caught in
 (7) each of those areas in each of those years and multiplying it
 (8) out
 (9) Q For these five fisheries the damage number is
 (10) \$163 810 000 and is that - in your opinion is this the damage
 (11) that the Exxon Valdez oil spill cost the fishermen price for
 (12) pink salmon in these fisheries?
 (13) A Yes it is
 (14) Q And you did the same thing in Exhibit 449 with regard to
 (15) kings is that a correct statement?
 (16) A That's correct
 (17) Q And in Exhibit 450 you did it with regard to chums?
 (18) A That's correct
 (19) Q Again broken down by year and by fishery?
 (20) A Yes
 (21) Q And in Exhibit 460 we lumped the two kinds of herring
 (22) together in Exhibit 460?
 (23) A Yes
 (24) Q And that number is \$27 258 000?
 (25) A Yes

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- (1) Q With regard to all of these that we've looked at is it
 (2) your opinion that those numerical damages were caused by the
 (3) Exxon Valdez oil spill?
 (4) A That's my opinion
 (5) Q And in Exhibit 6007 which is in evidence we lay it out by
 (6) fishery and by type?
 (7) A That's right So those figures you've summed the
 (8) three year effect in each one of those
 (9) Q For herring and the four species of salmon and the total
 (10) damage number is \$580 445 000?
 (11) A That's correct
 (12) Q And for the jury's convenience with regard to Alaska salmon
 (13) and not herring but Alaska salmon and I'll get to herring in
 (14) a minute Exhibit 784 is a different array for salmon That's
 (15) done by species and by year so we're just slicing the pie
 (16) differently So it's a - it's the same numbers the same
 (17) damage number but for salmon we're slicing the pie instead of
 (18) by fishery and by species by species and by year?
 (19) A That's right So these numbers involve adding up the
 (20) effects in each of the areas
 (21) Q And if you were to take a look at Exhibit 784 and Exhibit
 (22) 460 which does the same thing for herring these two exhibits
 (23) the 460 and 784 are the herring and the salmon impacts that go
 (24) into this total?
 (25) A That's correct

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- (1) Q So the exhibits contain the same information but they
 (2) allow the jury when it's time for them to do so to either
 (3) analyze them by species and oiled area or by species and year?
 (4) A That's correct It's exactly the same information
 (5) Q And these two total this one?
 (6) A Yes
 (7) Q And is it your opinion that the Exxon Valdez oil spill had
 (8) an adverse price effect on the prices received by fishermen for
 (9) herring red salmon pink salmon king salmon chum salmon
 add
 (10) in the oiled fisheries for 1989 1990 and 1991?
 (11) A That is my opinion
 (12) Q And the amount of that impact was \$580 445 000?
 (13) A Yes
 (14) MR O NEILL And I have no further questions
 (15) Doctor Thank you very much
 (16) THE COURT You may cross-examine
 (17) CROSS EXAMINATION OF ROBERT MENDELSON
 (18) BY MR COOPER
 (19) Q Good morning Dr Mendelsohn I don't believe that we have
 (20) met before I am Burt Cooper How are you?
 (21) A Very well
 (22) Q We have put up there on the witness stand some documents
 (23) that we won't ask you to read every word of that
 (24) A Thank you
 (25) Q Or not even most words in those but we may be referring to

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- (1) them from time to time So I - so you'll have them there you
 (2) can look at them
 (3) Doctor just a couple of questions at the outset Is it -
 (4) you referred to having worked as I recall a response to
 (5) Mr O'Neill's questions some - did I hear it right 1400
 (6) hours on -
 (7) A At least 1500 hours
 (8) Q In the last four years or so?
 (9) A Yes
 (10) Q And that was on what?
 (11) A That is working on various aspects of - of this fish price
 (12) effect
 (13) Q This is the - is this litigation the first project that
 (14) you had that involved prediction of fish prices?
 (15) A Yes it is
 (16) Q And so you hadn't ever been involved before this case in
 (17) predicting salmon prices then I assume?
 (18) A I've hardly ever been involved in any court cases
 (19) Q I didn't mean with respect to court cases Just
 (20) generally
 (21) A That's correct
 (22) Q And you haven't predicted generally herring prices before
 (23) you got involved with this case?
 (24) A That's correct
 (25) Q So this was kind of your first stab at it?

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- (1) A At predicting prices salmon prices yes
 (2) Q And herring?
 (3) A That's correct
 (4) Q You have not previously - or at least before this
 (5) litigation you had not published any articles on how to
 (6) predict salmon or herring prices had you?
 (7) A No I had not
 (8) Q Or on just prices of fish generally in any other respect?
 (9) A That's correct
 (10) Q So you were kind of getting on the job training in this
 (11) litigation?
 (12) A On this particular aspect of the case yes
 (13) Q You didn't feel like you brought any particular expertise
 (14) in the fisheries area then when you came on to this case?
 (15) A No You have to realize that natural resource economics
 (16) deals with the economics of fisheries so I've taught this
 (17) subject for 15 years
 (18) Q Fish pricing though?
 (19) A Yes That's part of the market for fish part of managing
 (20) fisheries
 (21) Q Now you told us about the computer model that you
 (22) developed and I got - I'll have to concede here right off -
 (23) right off the bat that you're going to know one heck of a lot
 (24) more about computer models than I do but let me ask you a
 few
 (25) questions about it

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- (1) In this computer model you're basically determining how
 (2) well certain things correlate with fish prices?
 (3) A You're trying to determine the magnitude of the effect
 (4) Q Of the correlation?
 (5) A Of the size of the effect of how much a particular factor
 (6) might affect fish prices
 (7) Q Does the computer model tell you cause and effect or does
 (8) it tell you correlation?
 (9) A Well it turns out cause and effect is a combination of
 (10) economic theory that is what factors do you expect to be
 (11) important and if it turns out they're important empirically
 (12) then that corroborates a theory you had before on cause and
 (13) effect
 (14) Q I think you said what I was driving at there Let me see
 (15) if I understand it You need to bring some judgment to what
 (16) these computer models show to figure out if they're coming out
 (17) with a result that really makes sense?
 (18) A You need to have judgment in terms of understanding how to
 (19) interpret the results and also in terms of understanding how to
 (20) build the models that's correct
 (21) Q Let me use an example It's probably kind of a hokey one
 (22) but maybe it'll help me at least I suspect if an observer
 (23) came in here maybe an econometrician like yourself came into
 (24) the courtroom and watched what went on for a week or so he o
 (25) she would observe that every day several times a day

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- (1) everybody stands up and shortly thereafter the judge comes
 (2) through comes into the courtroom You've probably seen that
 (3) yourself?
 (4) A Yes I've observed that already today
 (5) Q Now that doesn't mean though does it that it's the -
 (6) it's the people in the courtroom standing up that cause the
 (7) judge His Honor to come into the courtroom?
 (8) A No
 (9) Q You wouldn't draw that conclusion?
 (10) A That would be a conclusion I would not draw no
 (11) Q In fact it's probably the other way around wouldn't you
 (12) say?
 (13) A Yes In fact we guessed that from other information we've
 (14) got
 (15) Q That's kind of an example where you need to bring some
 (16) judgment and some knowledge about what's going on to these
 (17) regression kind of analyses that tell you about correlations?
 (18) A To tell you how to interpret the results that's correct
 (19) Q I mean I've heard other examples and I won't go into
 (20) them except you probably - people I am told for instance
 (21) have conducted humorous studies that show that every time the
 (22) economy goes into a boom period like during the twenties and
 (23) during the late sixties that hemlines tend to rise but
 (24) whenever the economy goes bust hemlines tend to go down
 (25) Have you ever run across that example?

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- (1) A I'm not a fashion expert that's for sure
 (2) Q I'm not either but in any event you got to be careful
 (3) about - I mean you wouldn't conclude from that if that were
 (4) in fact the phenomena observed you wouldn't conclude that
 (5) dress designers have the ability to determine which way the -
 (6) cause which way the economy goes?
 (7) A I would not guess that hemlines cause economic
 (8) development
 (9) no
 (10) Q So it's fair to say then that one of the things that we
 (11) have to do and you've tried to do I assume is to bring to
 (12) bear on your computer model knowledge of the fishing
 (13) industry
 (14) and particularly the salmon and herring industry in Alaska in
 (15) order to figure out that these results really make sense?
 (16) A There are sort of two roles for that One is determining
 (17) what factors ought to be included and the second which I
 (18) think is what you're more driving at is how you interpret
 (19) results you get from the models
 (20) Q I guess a kind of a threshold question there is is there
 (21) indeed a correlation between the factors you're looking at and
 (22) if there is one you go to the next step and try to figure out
 (23) what this means?
 (24) A That's right the empirical data gives you a result and you
 (25) must interpret it
 (26) Q Let me kind of - in the vein of maybe testing your model a
 (27) little bit let's talk about sockeye Your model predicts for

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- (1) instance that there was a difference between actual and the
 (2) predicted price using your factors for sockeye in 1991?
 (3) A Yes
 (4) Q Which as I understand it you ascribe that to the oil
 (5) spill that difference?
 (6) A That's correct
 (7) Q Notwithstanding that 1991 is three years after the spill?
 (8) A That's correct
 (9) Q And in fact if I recall correctly the amount of the
 (10) difference between actual and predicted what you call the
 (11) spill effect actually increases from - in 1990 over 1989?
 (12) A In the sockeye market?
 (13) Q For sockeye yes
 (14) A Slightly yes
 (15) Q And it increases again in 1991 over 1990?
 (16) A Again that's true in the sockeye market Yes
 (17) Q See if I can lay my hands on that exhibit I believe it's
 (18) 444 Is that the one? You probably don't have that up there
 (19) do you?
 (20) A I don't see it
 (21) Q The one that I have doesn't have the pretty colors on it
 (22) but let me put it up here
 (23) This was your sockeye salmon -
 (24) A The sockeye salmon model yes
 (25) Q - prediction? So your model would say that in '89 this

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- (1) what I'm pointing to here is the difference - this is the
 (2) predicted and this was the actual so you're saying that's the
 (3) spill effect?
 (4) A That's correct
 (5) Q And then in 1990 a year later your model predicts that
 (6) apparently the passage of time has somehow heightened the
 (7) fears
 (8) of buyers?
 (9) A I wouldn't exactly put it that way What the model
 (10) predicts is that there was no - the market factors which
 (11) caused prices to continue to increase yet they continued to
 (12) decrease to decline
 (13) Q You attributed all that additional increase between
 (14) difference and actual to the spill and yet it's one year later
 (15) correct?
 (16) A That's correct
 (17) Q Then you come to 1992 two years after the spill?
 (18) A '91?
 (19) Q I'm sorry '91 If I haven't said it already I'm lousy
 (20) with numbers Dates are no better
 (21) In 1991 you've got an effect that's even much greater?
 (22) A In 1991?
 (23) Q I'm sorry 1991
 (24) A Yes
 (25) Q Now another thing that interested me here is that
 (26) let's - well let me ask you this question You in the

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- (1) course of these 14 or 1500 hours that you've spent working on
 (2) this matter have you - you've looked at prices for salmon
 (3) from other locations other countries?
 (4) A I have looked at some of the wholesale prices in Japan
 (5) that's correct
 (6) Q You didn't look at prices anywhere else?
 (7) A I'd seen prices in some of the - in some of the exhibits
 (8) provided by the defendants for British Columbia
 (9) Q Well that - let's take British Columbia and let's take
 (10) 1992 - 91 the year when you have this big spill effect Do
 (11) you know - what price do you predict under your model would
 (12) have prevailed for sockeye salmon in Alaska in 1991?
 (13) A Exactly which price?
 (14) Q Well more or less
 (15) A I can't remember off the top of my head You have the
 (16) chart so - this looks like a price around \$3 00
 (17) Q Little over \$3 00?
 (18) A Yes
 (19) Q I'll tell you that if the way we calculated was right it
 (20) was about three dollars I think and eighteen cents does that
 (21) sound about right?
 (22) A I think it will be
 (23) Q You're saying if there had been no spill in Prince William
 (24) Sound the price to fishermen in 1991 in Prince William Sound
 (25) and other areas of Alaska would have been \$3 18 per pound?

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- (1) A That's what this model says yes
 (2) Q Now the price in fact in British Columbia in 1991 was
 (3) about how much?
 (4) A I don't know I wouldn't be able to tell you that off the
 (5) top of my head
 (6) Q Wasn't that of some interest to you?
 (7) A Well I knew that it had the same pattern as Alaskan
 (8) prices so it - if I had to guess I would guess it was very
 (9) similar to the actual prices in Alaska
 (10) Q You also knew did you not that there was no oil spill -
 (11) the Exxon Valdez oil spill was in Alaska it wasn't in Canadian
 (12) waters?
 (13) A That's correct
 (14) Q In fact most of the British Columbian salmon comes from
 (15) where?
 (16) A The British Columbian salmon?
 (17) Q Yes
 (18) A I'm not sure but I thought it came from the Frazer
 (19) Q That's where?
 (20) A Vancouver
 (21) Q That's the river that comes through Vancouver isn't it?
 (22) A Yes
 (23) Q How far away is that from the site of the spill?
 (24) A That's very far away
 (25) Q Over a thousand miles probably?

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- (1) A That's correct
 (2) Q So we're now in British Columbia we're at least a thousand
 (3) miles away from the spill and we're three years away from the
 (4) spill and you're saying that the price that they would have
 (5) had in - or would have enjoyed in Alaska this 3 18 price
 (6) would have been enjoyed even though the price of British
 (7) Columbia salmon at the time was - and I'll represent this to
 (8) you this will be the subject of proof later on but if you
 (9) don't recollect it was about 1 33 a pound
 (10) A Okay Well that's exactly right and my feeling is -
 (11) Q That price then in other words the British Columbia
 (12) price in 19 - the actual in 1992 was right around here?
 (13) A In 1991
 (14) Q I'm sorry 1991
 (15) A If that's the date yes
 (16) Q Now does that - that means then what you're saying if
 (17) there hadn't been any spill even though a Japanese buyer
 (18) could
 (19) have gone to British Columbia in 1991 talking 1991 now and
 (20) bought salmon for 1 33 a pound nevertheless that Japanese
 (21) buyer would have been willing to go to Alaska and pay \$3 18 a
 (22) pound?
 (23) A My reason for that is this spill was so large in Japanese
 (24) minds it tainted sockeye It doesn't make any difference
 (25) where the sockeye came from it's tainted
 (18) have gone to British Columbia in 1991 talking 1991 now and
 (19) bought salmon for 1 33 a pound nevertheless that Japanese
 (20) buyer would have been willing to go to Alaska and pay \$3 18 a
 (21) pound?
 (22) A My reason for that is this spill was so large in Japanese
 (23) minds it tainted sockeye It doesn't make any difference
 (24) where the sockeye came from it's tainted
 (25) Q Have you talked to any economists from British Columbia to

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- (1) see if they share that view with you?
 (2) A I've read some of the literature from British Columbia
 (3) yes
 (4) Q And in fact you have never read anything that suggested
 (5) that British Columbia sockeye suffered some kind of taint
 (6) impact from the spill have you?
 (7) A I've never seen anyone study that that's correct
 (8) Q In fact if British Columbia had suffered from the spill
 (9) anybody thought that that was really something that had
 (10) happened an economist wouldn't you expect to have seen
 (11) somebody write something about that subject?
 (12) A Well this is one of the issues where my expertise and
 (13) fishery economist's expertise are different My expertise is
 (14) to discover what affects pollution has on markets Fishery
 (15) economists they try to understand what fishery markets have
 (16) on
 (17) future markets
 (18) One of the things you see if you look at the fishery
 (19) economists and what they've written they try to explain
 (20) everything they observe on the basis of fishery market
 (21) variables and if you look at the variables that they used
 (22) prior to the spill they have for example never thought
 (23) farmed salmon was going to be important for sockeye
 (24) Q Who never thought that?
 (25) A The fishery experts They basically said you know farmed
 salmon is important in some markets but not really very

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- (1) important in sockeye But you look after the spill after the
 (2) spill had already knocked prices down when they were trying
 to
 (3) use what little they understood about the future in market to
 (4) explain the pollution effects then all the sudden they thought
 (5) that the farm salmon very well did affect sockeye prices
 (6) Q So what you re saying is the economic works or articles or
 (7) whatever you ve seen indicates that farmed salmon had an
 impact
 (8) on prices?
 (9) A What I m trying to say is that - that the results that the
 (10) fishery experts found were different before the spill and after
 (11) the spill Something has changed even in their models where
 (12) there s no spill effect being measured at all
 (13) Q Something they think has changed is the impact of farmed
 (14) salmon?
 (15) A That s right and the question is why
 (16) Q And do you believe - well you don t have - you don t
 (17) attribute any of that spread between your predicted and actual
 (18) price we were just looking at a moment ago to the impact of
 (19) farmed salmon do you?
 (20) A No because it s included in the model
 (21) Q Not even in 1991?
 (22) A That s right because it s already in the model It s
 (23) already in the predicted prices
 (24) Q You re claiming that whole entire spread -
 (25) A That s exactly correct

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- (1) Q - was the spill effect?
 (2) Let me move to a different subject but kind of the same
 (3) general area of bringing some common sense to the subject of
 (4) what a model can show The - let s talk about silver salmon
 (5) cohos
 (6) Now the silver salmon swim - well there are silver
 (7) salmon that are commercially fished in the State of Alaska are
 (8) there not?
 (9) A That s correct
 (10) Q Indeed they re commercially fished in virtually all of the
 (11) areas that are the subject of the charts that you ve shown us
 (12) today?
 (13) A That s correct
 (14) Q And those coho salmon basically were swimming in the same
 (15) waters as were the sockeye salmon and the pinks and these
 other
 (16) species in 1989 at the time of the spill?
 (17) A That s correct
 (18) Q And the - if consumers or buyers had some concern that the
 (19) spill might cause a taint problem you would expect would you
 (20) not that that would show up also in connection with cohos?
 (21) A You would
 (22) Q I mean you don t think that a Japanese - the mother in a
 (23) Japanese - in a Japanese market as she s buying food or fish
 (24) for the family meal is going to somehow say the coho s all
 (25) right if she s thinking at the same time that the red - that

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- (1) the sockeye isn t all right because of the spill?
 (2) A That s right That s why I meant there were seven
 (3) experiments and there are seven results and what you re
 (4) pointing out is one of the results It may not have been a
 (5) price effect from the spill
 (6) Q But what I m driving at is well precisely that I guess
 (7) your model shows there is no price effect for coho?
 (8) A The model shows that the price effect is very mixed and my
 (9) feeling was that the other results were so strong that I didn t
 (10) want to include these very mixed results with them and so to
 (11) be conservative I ve dropped them I ve dropped the coho
 (12) effects
 (13) Q You dropped the coho effects - dropped the coho price
 (14) effect because your model didn t show there was really much of
 (15) a price effect there isn t that what it boils down to?
 (16) A I ve done a lot of different models In some of the models
 (17) there is a price effect in cohos but because it is mixed some
 (18) of the model don t show it I ve decided you don t want to
 (19) include that in damages
 (20) Q And in fact your testimony is is it not that you cannot
 (21) have - you cannot apply a model in which you have sufficient
 (22) confidence that shows an effect in coho salmon to allow you to
 (23) stand here and say that there was such an effect?
 (24) A That s right some of the model I tested showed there was
 (25) effect and as I said the model which I used in this report

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- (1) did not show a very strong effect and what we re trying to do
 (2) is show if things are having a mixed effect not to include it
 (3) as a damage
 (4) Q Because you don t have enough confidence that your
 models
 (5) vanous ones showed any real impact on coho?
 (6) A In the case of the coho I m not confident whether it was a
 (7) market effect or whether it was an oil spill effect I can t
 (8) tell and so because I can t tell for sure I m not counting it
 (9) as a damage
 (10) Q And indeed so far as you re aware the plaintiffs are not
 (11) claiming that there is any effect on coho effect on coho?
 (12) A That s correct
 (13) Q Now what - what is the current price if you know -
 (14) well let me back up a minute if I understand your charts
 (15) correctly and what the plaintiffs have indicated they are
 (16) making a price claim and you are supporting their price claim
 (17) for the years 1989 Right?
 (18) A That s correct
 (19) Q 1990?
 (20) A Correct
 (21) Q And 91?
 (22) A That s correct
 (23) Q I got it right that time
 (24) A Yes
 (25) Q And the - but there s no claim for a price effect beyond

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- (1) 1991?
- (2) A I ve only studied up through 1991 that s correct In the
- (3) paper - in the report that I provided the Court it only
- (4) includes through 91
- (5) Q You ve only run your models through 91?
- (6) A No Actually I ve done some work since that that go
- (7) through 92
- (8) Q Now the current price more or less for sockeye do you
- (9) know what that is?
- (10) A Well year end prices they re not finalized until later
- (11) so current price in terms of a 93 price I believe the 93
- (12) prices have recovered some from - well 92 prices went up
- (13) slightly and 93 prices came back down slightly and I don t
- (14) believe we know what the 94 prices are yet
- (15) Q But in terms of dollar amounts do you know about what they
- (16) are?
- (17) A Well we don t have year end 94 prices at all
- (18) Q The prices that you do have
- (19) A Well the final prices that I ve seen in 92 was -
- (20) Q 92?
- (21) A Yes
- (22) Q You haven t got any for 93?
- (23) A I believe the 93 prices are just preliminary at this
- (24) date
- (25) Q I guess what I was trying to drive at is do you know what

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- (1) the preliminary 93 prices are?
- (2) A My recollection is that they have - they re similar to the
- (3) 91 prices but I don t remember exactly what number they
- (4) were
- (5) Q They re down pretty low in any event?
- (6) A Yes
- (7) Q Compared to historical highs?
- (8) A That s correct
- (9) Q Now you will agree will you not that there are obviously
- (10) factors other than the oil spill that have produced some major
- (11) reductions in prices of salmon to the point where we ve had
- (12) these 93 prices that you re talking about?
- (13) A It s clear from the modeling work that I ve done that in
- (14) some circumstances the prices would decline from 89 levels -
- (15) from 88 levels for sure
- (16) Q For reasons having nothing to do with the oil spill?
- (17) A For market reasons that s what the predicted prices of
- (18) market show for example in pink
- (19) Q Now have you ever - you have utilized I m sure have you
- (20) not the publication called Salmon News?
- (21) A I did not really utilize it no
- (22) Q You are aware of that?
- (23) A I m aware of it yes
- (24) Q That is indeed a publication that comes out from time to
- (25) time about salmon marketing pricing and so forth?

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- (1) A Yes it is
- (2) Q Do you have Exhibit 3048 in front of you there?
- (3) A Yes
- (4) Q You ve seen that before haven t you?
- (5) A I m not sure
- (6) Q Part of your general background study in this whole area?
- (7) A I couldn t - I - it looks familiar but I wouldn t be
- (8) able to say whether I ve seen this particular issue before
- (9) Q You know who Gunter Knapp is do you not?
- (10) A Yes I do
- (11) Q Can you tell us who Gunter Knapp is?
- (12) A Gunter Knapp and I went to graduate school together and we
- (13) actually worked a lot on fisheries in the past together He s
- (14) an expert here in Alaska
- (15) Q He s a professor of economics at the University of Alaska
- (16) at Anchorage?
- (17) A That s correct
- (18) Q And he is a - you would recognize him as an expert in
- (19) salmon salmon pricing would you not?
- (20) A He s an expert in salmon markets but not an expert in
- (21) quantifying salmon effects that s right
- (22) Q He certainly is somebody who s very knowledgeable about
- (23) markets and what is causing major changes in salmon markets
- (24) is
- (25) he not?
- (26) A Yes

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- (1) Q Now let me show you this exhibit I ll put this Exhibit
- (2) 3048 on the machine here
- (3) THE COURT Is that a plaintiffs or a defendants
- (4) exhibit?
- (5) MR COOPER It s a DX Your Honor 3048
- (6) BY MR COOPER
- (7) Q There s a note on the bottom Sorry I didn t have a
- (8) brighter highlighter but in any event it indicates at the
- (9) bottom this paper is by Gunter Knapp and identifies him as we
- (10) just indicated It is the first in a series of papers and
- (11) workshops intended to provide information and then it looks a
- (12) little illegible there to fishermen and others to work
- (13) together to improve the salmon market Sponsors are the
- (14) Alaska
- (15) Commercial something and Agricultural Bank CFAB I think
- (16) that
- (17) is?
- (18) A Uh huh
- (19) Q Do you know what that is?
- (20) A Actually I m not sure
- (21) Q I think it s Commercial Fisheries and Agricultural Bank?
- (22) A Okay
- (23) Q You understand that that is a state organization that was
- (24) set up in order to help fisheries in agriculture?
- (25) A (Nods head up and down)
- (26) Q And the Alaska Department of Commerce - now this is in
- (27) November 1991 and in this publication Mr Knapp or
- (28) Professor

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- (1) Knapp indicates - this is November 91 This is still within
 (2) the time period that you believe or you are claiming that
 (3) there s a spill effect that accounts for the entire difference
 (4) between your predicted and actual prices?
 (5) A That s correct
 (6) Q And Mr Knapp indicates since 1988 - well Mr Lynch
 (7) reminds me that I probably need to zoom in
 (8) Since 1988 Alaskan salmon fishermen have watched the
 (9) bottom drop out of harvest price For several years before
 (10) that prices had soared I take it so far you re in agreement
 (11) with what Professor Knapp indicates?
 (12) A Absolutely
 (13) Q Then he says what caused the boom and bust in salmon
 (14) prices
 (15) and he gives reasons for that Now the first reason he gives
 (16) is that they boom between 85 and 88 because there was a
 (17) temporary drop in the world salmon supply at the same time the
 (18) value of the yen was rising You would agree with that?
 (19) A Yes
 (20) Q Then he says prices crashed between 88 and 91 because
 (21) the
 (22) rapidly growing supply of both wild and farmed salmon
 (23) outstripped demand I gather that here is where you depart
 (24) from Professor Knapp?
 (25) A Well you have to -
 (26) Q First just establish that you don t agree with him here do
 (27) you?

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- (1) A I disagree with the adjectives he s using
 (2) Q Don t you disagree entirely with the cause that he assigns
 (3) to the crash?
 (4) A Well the models that we just went through shows that in
 (5) fact in fisheries like in the pink salmon market where there
 (6) was a big increase in supply you do see prices going down
 (7) Now whether we described that as a crash or whether it s just
 (8) a small decrease in prices that s where I would disagree with
 (9) him It s choices of adjectives
 (10) Q What he s talking about here is the absolute level that the
 (11) prices have dropped down to correct?
 (12) A It s not clear See Dr Gunter has never really
 (13) quantified the size of the effects He s never quantified
 (14) which of the factors are doing what
 (15) Q It s pretty clear what his belief is from this Doesn t he
 (16) say that they crashed because of the rapidly growing world
 (17) supply?
 (18) A That s what he says in this particular case
 (19) Q There s nothing unclear about that is there?
 (20) A Well the question is did he take into account the oil
 (21) spill when saying that and the fact of the matter is he s
 (22) never done that
 (23) Q Well the fact of the matter he apparently doesn t believe
 (24) at that time the oil spill was a cause of this crash in the
 (25) prices?

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- (1) A I believe if you asked him he would tell you that he s
 (2) never examined that issue He s never examined whether the
 (3) oil
 (4) spill reduced prices
 (5) Q He certainly examined the crash sufficiently to apparently
 (6) form the opinion that the world supply caused the drop?
 (7) A I just - I don t disagree that if there s a large increase
 (8) in supply it will cause prices to go down but the question is
 (9) how much
 (10) Q Let s look at the next bullet here He says farmed salmon
 (11) will increasingly compete with Alaskan salmon in world
 (12) markets I presume you will agree with that?
 (13) A Yes
 (14) Q Now let me show you - I d like to show you one other
 (15) document here You see Exhibit DX2802? You have that in
 (16) front
 (17) of you there Doctor?
 (18) A Yes
 (19) Q And that is a report is it not by the general accounting
 (20) office of the United States government?
 (21) A That s correct
 (22) Q And it is entitled International Trade Factors Affecting
 (23) the Price of Alaskan Bristol Bay Sockeye Salmon?
 (24) A That s correct
 (25) Q You ve seen this before?
 (26) A Yes
 (27) Q And as you understand it the purpose of this report was

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- (1) for the general accounting office to answer some questions that
 (2) had been asked by congressional representatives from Alaska
 (3) or
 (4) from fish producing states?
 (5) A My understanding is this had something to do with concern
 (6) about a price fixing issue
 (7) Q Was it addressed as the general question as to what caused
 (8) the prices to fall?
 (9) A Yes but it - this was clearly not asking whether this was
 (10) an effect that was due to an oil spill or not The question
 (11) was focused on another issue
 (12) Q Let s look at the document then Government accounting
 (13) office et cetera the title factors affecting the price of
 (14) Alaskan Bristol Bay sockeye salmon
 (15) And if we go to the first page it s addressed to - there
 (16) I think I ve got it
 (17) It s addressed to the Honorable Leon E Panetta and Don
 (18) Young House of Representatives and it says as requested we
 (19) examined issues related to the prices commercial fishermen
 (20) received after their 1991 catch of sockeye salmon in Alaska
 (21) Then it talks about many fishermen having gone on strike that
 (22) year because the prices were so low?
 (23) A That s correct
 (24) Q And it pounds out that the 70 cents a pound price
 (25) eventually negotiated between the fishermen and processors
 (26) was
 (27) one third lower than the 1990 price and well below the \$2 10

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- (1) price paid in 1988 all of which I assume you'll agree with?
 (2) A Yes
 (3) Q And then they say we focused our work on identifying the
 (4) principal economic factors that have contributed to this year's
 (5) low prices. That's precisely what they were trying to do
 (6) wasn't it in this report?
 (7) A Exactly so that what they looked at was just market
 (8) factors
 (9) Q And after looking at market factors the principal economic
 (10) factors what they came up with was a combination of three
 (11) factors that explained much of the downward pressure on the
 (12) price for Bristol Bay sockeye salmon. So far we're together?
 (13) A Yes
 (14) Q And those were the size of the catch there the inventory
 (15) of salmon in Japan?
 (16) A Yes
 (17) Q And the competitive importance of farmed salmon in the
 (18) Japanese market?
 (19) A Exactly
 (20) Q And can we agree that they do not identify the oil spill as
 (21) a factor in the price?
 (22) A They do not look at the oil spill that's correct. They
 (23) don't examine that issue.
 (24) Q And do you not believe that the general accounting office
 (25) in responding to the congressmen if they believed or came

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- (1) across indications that the oil spill was some kind of a
 (2) significant factor they would have mentioned that?
 (3) A If the congressmen asked them to look at the oil spill
 (4) they would have addressed it yes. That wasn't what they were
 (5) asked to address.
 (6) Q And you believe that they simply left out what you say is a
 (7) major factor in responding to the congressmen's concerns
 (8) about
 (9) the low prices in Bristol Bay?
 (10) A That's correct.
 (11) Q Now while we're on the subject of farmed salmon - or at
 (12) least we've touched upon that let me move to that. If I
 (13) understood it correctly under your model if the - if the
 (14) amount of farmed salmon production increases that has the
 (15) effect of increasing the price of sockeye?
 (16) A That's what the results show yes exactly.
 (17) Q Well and you believe in those results do you not?
 (18) A Well they're empirically correct. The question is how to
 (19) interpret them.
 (20) Q Well I guess the fishermen would interpret them by jumping
 (21) up and down with joy if the farm production goes way up in the
 (22) rest of the world?
 (23) A That's not how I interpret them. I interpret them that the
 (24) farmed salmon variable is relatively unimportant in this data
 (25) and what it's doing is acting as a proxy for Japanese buying
 power.

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- (1) Q So it's your belief that indeed farmed salmon production
 (2) increases do result in an adverse impact on prices of salmon?
 (3) A Prior to the spill I would have said it would have almost
 (4) no impact on fisheries such as the sockeye fishery because the
 (5) sockeye fishery and the Atlantic salmon fishery aren't very
 (6) closely connected. The Japanese before the spill did not
 (7) look at Atlantic salmon as being a close substitute for
 (8) sockeye.
 (9) Q Well we obviously - we have a disagreement there and
 (10) we'll hear more witnesses on that subject later but your model
 (11) says there was a price impact not just in '89 but in '90 and
 (12) '91?
 (13) A That's correct.
 (14) Q And is it in fact the case then that in - well let's
 (15) take it year by year. In 1989 did increase in production of
 (16) farmed salmon make prices of sockeye salmon - influence
 (17) those
 (18) prices in an upward direction or a downward direction?
 (19) A Are you asking me what the model would have predicted that
 (20) variable would do or are you asking me how I think that
 (21) variable actually affected real prices?
 (22) Q Let's ask first in the model. Your variable would cause
 (23) what prices to go which way?
 (24) A In my model where I believe the farmed salmon variable is
 (25) acting as a proxy for Japanese income it would have predicted
 prices would have gone down slightly.

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- (1) Q And in 1990?
 (2) A It would have gone up again.
 (3) Q And in other words the more farmed salmon in 1990 that
 (4) floods the market the higher the price of sockeye is going to
 (5) be?
 (6) A That's right.
 (7) Q Under your model?
 (8) A Because it's acting as a proxy of the Japanese buyer
 (9) factor.
 (10) Q I know you're fond of that we'll come back to that. In
 (11) 1991 your model predicts?
 (12) A Would have predicted again an increase in prices.
 (13) Q So in 1991 if we could flood the market with farmed
 (14) salmon your market would say the price of the rest of the
 (15) salmon's going to go up?
 (16) A That's correct.
 (17) Q And if that were the case then the fishermen in Alaska
 (18) ought to be jumping for joy if Norway and Chile and Scotland
 (19) and all these other producers of farmed salmon increase their
 (20) production and start pumping it out?
 (21) A That would be an inappropriate use of the model that's
 (22) correct you could say that.
 (23) Q I think what you're telling me is that the variable in your
 (24) model that you have identified or that is identified as farmed
 (25) salmon isn't really farmed salmon?

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- (1) A That s correct
 (2) Q So you produced these whole series of models that basically
 (3) have got the wrong characterization here for this particular
 (4) element?
 (5) A Well I ve done some work since then I ve actually
 (6) included Japanese buying power which is this variable that
 (7) you re saying I ve omitted and I get - I still get these
 (8) taint effects These taint effects don t go away
 (9) Q Before we get to that let me just make sure that I
 (10) understand You produced a report to us Exhibit 437 I think
 (11) it was?
 (12) A That s correct
 (13) Q And you ve got that in front of you there and on page
 (14) T2 -
 (15) A T2?
 (16) Q T2 is what mine says at the bottom
 (17) A I m not sure what you re referring to
 (18) Q I ll tell you what if I may approach Your Honor let me
 (19) just show you this -
 (20) A Oh I see
 (21) Q You have it?
 (22) A The table? Yes I see it
 (23) Q On PX437 the table in your report this is the one that -
 (24) this is your linear OLS model of Alaskan salmon prices?
 (25) A Yes This is a description of the model we ve been

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- (1) discussing up till now
 (2) Q Now we ve been kind of teasing Mr Sanders here about
 (3) learning big words and big terms I m sure if we brought him
 (4) up here he could tell us what that OLS means but why don t
 (5) you tell us?
 (6) A It means I used ordinary least squares
 (7) Q He says I could have done it And that s a technique
 (8) that s used in computer model?
 (9) A In statistical modeling yes
 (10) Q What you listed up here this term dep variable that s
 (11) dependent variable?
 (12) A That is dependent variable
 (13) Q And the term you ve got in here is farmed?
 (14) A Yes that s world farmed salmon harvest
 (15) Q And what you plug into the model is a number that is -
 (16) that represents what some production pounds or something of
 (17) farmed salmon?
 (18) A Aggregate tons I believe but yes
 (19) Q And is it this the fact that there s no negative sign in
 (20) front of this number over here which I certainly won t try to
 (21) have you explain because I suspect it would take a while -
 (22) A Yeah The number above is giving you a sense of the
 (23) relationship between that variable and in this case sockeye
 (24) prices
 (25) Q And the fact that it s positive means that as the price of

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- (1) farmed - the quantity of farmed salmon goes up the price goes
 (2) up for in this case sockeye salmon?
 (3) A That s correct
 (4) Q Now you said - you said that you used a proxy or that you
 (5) believed that this farmed element - you now believe that
 (6) that s a proxy for something else?
 (7) A That s correct It s a proxy for Japanese buying power
 (8) Q For Japanese buying power? In other words somehow
 (9) Japanese buying power is the same thing as farmed salmon
 (10) quantity?
 (11) A If you look at the - if you charted both Japanese buying
 (12) power over time and farmed salmon over time what you ll see is
 (13) that all through the 70s they were relatively low practically
 (14) zero in the case of the farmed salmon and in the 80s they
 (15) rapidly increased so they both have exactly the same pattern
 (16) over time so they end up acting for each other
 (17) Q Then you are not - well are you or are you not of the
 (18) view that in 1989 90 and 91 the years you claim of the
 (19) price effect an increase in farmed salmon production had an
 (20) adverse impact on prices of sockeye salmon?
 (21) A Well in the model I ve used it increases but my
 (22) interpretation of that is that it s not due to the actual
 (23) farmed salmon resulting in higher prices but this proxy
 (24) effect
 (25) Q I understand that I guess what - the question I m asking

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- (1) I think is a little different Is it your view as you sit here
 (2) and testify today that in fact in 89 90 and 91 the - to
 (3) the extent that production of farmed salmon increased that
 (4) would have a lowering effect a reducing effect on prices of
 (5) sockeye salmon for Alaska?
 (6) A Yeah It turns out that when I included Japanese buying
 (7) power directly so it no longer was being fed through this
 (8) farmed salmon variable then in fact you get a very small
 (9) negative effect from the farmed salmon variable
 (10) Q So the answer to my question is that you agree -
 (11) A Yes
 (12) Q And increased farmed salmon production in those years in
 (13) fact would negatively affect sockeye salmon prices?
 (14) A Yes It s a negative effect and it s small
 (15) Q Now you say it s small and I d like to just stick with
 (16) that for just a moment You are familiar with the organization
 (17) known as the Alaska Seafood Marketing Institute?
 (18) A Yes
 (19) Q Sometimes called ASMI?
 (20) A Yes I am
 (21) Q And that is an organization that was set up in Alaska in
 (22) order to promote Alaskan seafood sales and marketing?
 (23) A That s correct
 (24) Q And you re aware - well you re aware of a report that
 (25) ASMI did in I believe it was 1991 late 91 or early 92

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- (1) called Salmon 2000?
 (2) A Yes I m aware of that report
 (3) Q 2000 meaning the year 2000?
 (4) A I don t know why they named it that but yes
 (5) Q And the board of directors of ASMI that consists of a
 (6) number of processors?
 (7) A I wouldn t be surprised yes
 (8) Q And fishermen?
 (9) A Yes
 (10) Q I think you have a copy of that report or at least some of
 (11) it as Exhibit 2806 and that is a DX You have it there?
 (12) A Yes
 (13) Q That s the one - you ve seen that before?
 (14) A Yes I have
 (15) Q And you ve read it?
 (16) A Yes
 (17) Q Let me just first put on this second - I believe it s the
 (18) second page of that document it just lists the board of
 (19) directors for ASMI and we have Mr Horgan large processor
 (20) fisherman large processor small processor et cetera Sheryl
 (21) Sutton fisherman Lance Ervin fisherman and so on You see
 (22) that?
 (23) A Yes
 (24) Q These are not exactly people you d expect to be fans of
 (25) Exxon would you?

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- (1) A I have no way of knowing
 (2) Q The report then indicates in the executive summary section
 (3) overview indicates Alaska salmon is losing ground at an
 (4) alarming rate after a decade of drastic change the Alaskan
 (5) salmon industry is at a critical juncture At the beginning of
 (6) the decade Alaskan salmon harvest accounted for 41 percent
 of
 (7) the world salmon supply By the end of 1990 Alaska salmon
 (8) accounted for just 31 percent
 (9) And then it talks about that decrease having occurred in
 (10) spite of a 50 percent increase in production And then it
 (11) says Alaska s dwindling market share is primarily due to the
 (12) increase in production of farmed salmon from one percent of
 (13) world supply in 1980 to 30 percent today
 (14) Now you will agree - can we agree that you disagree with
 (15) the authors of Salmon 2000 in the magnitude of the effect of
 (16) the farmed salmon phenomena?
 (17) A Depends what you re trying to argue If you re trying to
 (18) argue all total salmon produced anywhere in the world what
 (19) shares Alaska had of that total amount this statement is
 (20) perfectly accurate If you re trying to argue about what s
 (21) going on in the sockeye market per se what s happening to
 (22) sockeye the special fish then this is kind of irrelevant
 (23) because most of what s going on with the farmed salmon is
 (24) happening in Europe and the United States and sockeye s not
 (25) sold in Europe and the United States

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- (1) Q Are you saying that farmed salmon is not being sold at all
 (2) into Japan?
 (3) A What I m saying is that this - this particular statement
 (4) is addressing all salmon species as a group whereas most of
 (5) what we re concerned about here is the sockeye market what s
 (6) happened to the special sockeye fish and that s not going to
 (7) apply to sockeye
 (8) Q Let s break it down then You will at least agree with
 (9) respect to these other species of salmon that you have
 (10) testified to that farmed salmon has had a major impact in the
 (11) nature of driving those prices down?
 (12) A Well it s clear that farmed salmon that has had an impact
 (13) in terms of the purchase of salmon in Europe and the United
 (14) States that that s a place - those are the places where
 (15) farmed salmon has gone and if you re worried about market
 (16) share questions such as that then in those sites that s an
 (17) accurate statement that farmed salmon has caused a reduction
 (18) in market share
 (19) Q Isn t it true that Alaskan salmon used to be sold in some
 (20) of those places?
 (21) A That s correct
 (22) Q And it s been replaced by farmed salmon?
 (23) A That s correct It s largely pink
 (24) Q The market is pretty much a world one isn t it these days
 (25) for salmon?

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- (1) A The market that was always the key to the sockeye was
 (2) Japan Japan is the key to the sockeye market not what s
 (3) happening in Europe
 (4) Q So - well let me go back to the question that I was
 (5) asking a moment ago Are you saying or are you not saying
 that
 (6) the increase in farmed salmon production has had an effect a
 (7) negative effect on prices other than sockeye prices?
 (8) A My understanding reading this article is that it says
 (9) nothing about prices
 (10) Q Without regard to - without regard to - says nothing
 (11) about prices?
 (12) A This just talks about market share
 (13) Q Doesn t market share have - well let s go back to my
 (14) question Without regard to what the article says do you
 (15) believe that the increase in production of farmed salmon has or
 (16) has not had a substantial negative impact on prices of other
 (17) kinds of salmon besides sockeye?
 (18) A You re worried about Alaskan prices the Alaska salmon?
 (19) Q Prices for Alaska salmon let s take that
 (20) A It s - I don t have a - I don t disagree that it s going
 (21) to have a negative effect the direction of the effect is going
 (22) to be negative in general but there s not much evidence that
 (23) it was a dramatic effect
 (24) Q Not dramatic? If you d look at - I believe it s about the
 (25) fourth page in Unfortunately this does not have very good

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- (1) pagination on it If I could help - no it's page - that
 (2) A Page 2
 (3) Q The authors of Salmon 2000 indicate that the dramatic rise
 (4) in production and growing acceptance of farmed salmon as a
 (5) source of fresh salmon presents the greatest single threat to
 (6) Alaskan salmon
 (7) Now is it your belief that that statement has no
 (8) implications with respect to price of Alaska salmon?
 (9) A No that statement might
 (10) Q Might? It does doesn't?
 (11) A Yes
 (12) Q I mean isn't that what it's talking about when it says the
 (13) growing acceptance of farmed salmon as a source of fresh
 (14) salmon represents the single greatest threat to Alaska salmon?
 (15) A Yes
 (16) Q And then they go on to say that the consistent year round
 (17) availability and quality of fresh farmed salmon has made Alaska
 (18) salmon with its short season and quantities and supply
 (19) inconsistencies a secondary choice Would you agree with
 (20) that?
 (21) A It's certainly true that the consistent year round
 (22) availability and quality of farmed salmon has resulted in a
 (23) product that wasn't available before when you rely on wild
 (24) salmon because it all comes at one time
 (25) Q Isn't that the major advantage of farmed salmon? They've

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- (1) got the techniques down now where they can pull those farmed
 (2) salmon out of the pens any time during the year put them on a
 (3) air freighter and get them from Chile to Japan in just a matter
 (4) of hours fresh as can be?
 (5) A That is their evince yes It's kind of interesting In a
 (6) sense this is arguing that it's a strict substitute but one
 (7) of the other things that has happened because of this is
 (8) aggregate consumption of salmon has clearly increased
 (9) Q Let me move to some other subjects here quickly and I'll
 (10) try and finish up with you fairly quickly Were you here the
 (11) other day in the courtroom when Dr Crutchfield pointed out
 (12) that on his model he showed us where the - a couple of lines
 (13) diverged a little bit in 1983 I think it was '82 and he
 (14) said that was the botulism effect?
 (15) A I saw what was here this morning but not Friday
 (16) Q You're familiar with the fact that there was this botulism
 (17) scare in 1982 or so?
 (18) A Yes
 (19) Q And that involved somebody who died I understand of
 (20) botulism?
 (21) A It involved some contaminations of cans
 (22) Q Didn't somebody die?
 (23) A I believe that's the case yes
 (24) Q Now you didn't hear of any contamination of any cans as a
 (25) result of the oil spill did you?

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- (1) A That's correct
 (2) Q And certainly nobody died as a consequence of eating any
 (3) Alaskan salmon that was oiled in the oil spill?
 (4) A We certainly don't have any proof of that no
 (5) Q Nobody has made that claim that you're aware of have they?
 (6) A Not that I'm aware of
 (7) Q Now in your model your model doesn't show any effect
 (8) attributable to that botulism scare back in the early '80s
 (9) isn't that right?
 (10) A The model you saw in the report shows there was a minor
 (11) effect but it was not a significant one Some of the other
 (12) models that I've looked at do in fact pick up that botulism
 (13) effect in the pink salmon market
 (14) Q What I'm interested in I guess is your model and isn't
 (15) it in fact true that your conclusion was that the botulism
 (16) scare really didn't have a significant enough impact to include
 (17) in your model?
 (18) A That's true in this particular run of the model yes
 (19) Q And that's what - remember the statement I read is what
 (20) you testified to in your deposition do you remember that?
 (21) A Oh yes in this model the botulism effect was not a
 (22) significant effect In other models it was
 (23) Q I think Dr Mendelsohn that I'm almost done but I had
 (24) the feeling there was one or two other - all right There was
 (25) one other point I wanted to make and it's kind of a technical

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- (1) one but let me see if I can get some information from you
 (2) You probably weren't here the other day when Mr Hughes
 (3) testified on the subject of herring prices what herring prices
 (4) would have been in 1989 if there hadn't been an oil spill?
 (5) A No I'm not aware of that
 (6) Q Have you ever discussed with him the prices that he came up
 (7) with for different kinds of herring -
 (8) A No
 (9) Q - herring prices? Can you tell me what your - what your
 (10) predicted price is for Alaska roe on kelp for 1989?
 (11) A What the predicted price?
 (12) Q Yes
 (13) A If we can go back to the exhibits we can certainly see
 (14) that That was one of the factors you could easily read off
 (15) the chart
 (16) Q I think if you look at the Exhibit 455
 (17) A That helps
 (18) Q That's the one?
 (19) A Yes So in what year were you asking?
 (20) Q In 1989
 (21) A So in 1989 this model predicts the prices would have been
 (22) very close to \$3.00 a pound or underneath it
 (23) Q I think what we came out with was \$2.69 \$2.70 a pound
 (24) something like that?
 (25) A Something about that yes

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- (1) Q I gather when you were coming up with your predicted price
 (2) for herring roe spawned on kelp in 1989 you didn't talk to Mr
 (3) Hughes about what he was coming up with for his actual price?
 (4) A That's correct
 (5) Q If in fact the actual price that he came up with for 1989
 (6) for herring roe spawned on kelp is higher than your predicted
 (7) price you would agree I suspect that the - his estimation
 (8) of what the price would have been but for the oil spill if
 (9) that turns out to be higher than your predicted price you
 (10) would agree would you not that herring roe on kelp fishermen
 (11) ought not to get the benefit of both of those?
 (12) A That's correct
 (13) Q I'll tell you what I won't make you go through the math on
 (14) Mr Hughes' model or his numbers because you haven't seen
 (15) that
 (16) before
 (17) A That's correct
 (18) MR COOPER All right I have no further questions
 (19) THE COURT Redirect?
 (20) MR O NEILL Thank you Judge
 (21) REDIRECT EXAMINATION OF ROBERT MENDELSON
 (22) BY MR O NEILL
 (23) Q With regard to silver salmon the price of Alaska silver
 (24) salmon dropped precipitously like the other prices?
 (25) A That's correct
 (26) Q So its price pattern was consistent with what we saw with

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- (1) regard to all of the other fisheries?
 (2) A That's right
 (3) Q The problem is is when you crank the numbers the results
 (4) are not significant enough for you to draw a conclusion as to
 (5) why the drop occurred?
 (6) A That's right If we had the chart the corresponding chart
 (7) for the predicted price for the silver market one of the
 (8) things you would have seen is that our ability to predict the
 (9) variations that existed already in the market weren't very
 (10) good Prior to 1988 the model was not doing a very good job
 (11) of predicting all those variations you see in the price chart
 (12) and when you actually look at the taint effect the possibility
 (13) of a taint effect in some years it was very - it didn't exist
 (14) and in other years it was relatively small and that - it was a
 (15) very mixed result
 (16) Q When you said the model wasn't good at predicting the
 (17) modeling wasn't good at predicting the silver salmon?
 (18) A That's correct the silver salmon itself
 (19) Q And the problem with silver salmon there are so few fish
 (20) in the market that it creates a problem with regard to
 (21) statistical analysis?
 (22) A It certainly did create a problem There was a lot of
 (23) noise in this particular data set in the coho market It was
 (24) very difficult to analyze
 (25) Q But in any event silver salmon act consistently with what

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- (1) we found with regard to other salmon and our historical
 (2) knowledge about oil spills and fish?
 (3) A Yes You would have expected they would have been
 (4) affected
 (5) as well
 (6) Q Now I want to go to farmed salmon And if you - and you
 (7) and counsel for Exxon Corporation went on at some length
 (8) about
 (9) farmed salmon Would you tell us if you could how the oil
 (10) spill hurt fishermen in their competitive position with regard
 (11) to other sources of salmon?
 (12) A Yes I looked at a number of different fisheries seafood
 (13) and the only one that was affected was the high quality ones
 (14) So this is only an effect that occurs on high quality
 (15) fisheries and what we found is that basically the oil spill
 (16) has eliminated the premium that used to be associated with
 (17) these fisheries So these fisheries used to get a premium
 (18) they used to get a very high price relative to the fish you'd
 (19) get from other sources
 (20) After the oil spill that wasn't true anymore They were
 (21) treated just like everything else So after the oil spill you
 (22) do see them competing much more dramatically with farmed
 (23) salmon So if you look at fishery studies that were done
 (24) before this spill they kept concluding that impacted farmed
 (25) salmon wasn't going to be important in Japan but after the
 (26) spill when they tried to use market factors to explain that big
 (27) reduction in price they all conclude that it's farmed salmon

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- (1) competing
 (2) So what's happened is something's completely changed We
 (3) had one kind of effect before the spill and something else
 (4) afterward and what I'm arguing is that the oil spill
 (5) eliminated the premium With that premium gone the - these
 (6) fisheries are subject to this competition from outside and
 (7) they've lost that price and they've lost it for three years
 (8) Q And maybe longer?
 (9) A And from what little we can understand of '92 for longer
 (10) yes
 (11) Q So the oil spill because the Alaska fisheries compete
 (12) against other markets and historically have competed against
 (13) other markets they get whacked by the oil spill they lose the
 (14) premium and there's a long term impact on the ability of
 (15) Alaskan fishermen to sell their salmon in the rest of the
 (16) world?
 (17) A That's right You see an example just like this in the
 (18) bottled water market Perrier used to dominate bottled water
 (19) sparkling water then all the sudden they had some scare
 (20) There was some benzene in a couple bottles They eliminated
 (21) the benzene problem but in the meantime people didn't think
 (22) of
 (23) Perrier as the special product that absolutely had to be
 (24) purchased and as a result a whole bunch of other competitors
 (25) came in Now Perrier still hasn't recovered its former
 (26) position It's still way behind where it was before

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- (1) MR O NEILL I have nothing further Doctor Thank
 (2) you for coming
 (3) MR COOPER Your Honor if I could have just a couple
 (4) of questions on the benzene point that was just mentioned?
 (5) MR O NEILL It was a fair analogy within the -
 (6) within the scope of what he talked about
 (7) THE COURT I don t think that provides us a basis for
 (8) departing from our usual rule The examination is concluded
 (9) MR O NEILL Thank you Dr Mendelsohn
 (10) THE COURT Close enough to noon we should take our
 (11) recess at this point We ll be in recess for 15 minutes
 (12) (Jury out at 11 57)
 (13) (Recess from 11 57 a m to 12 16 p m)
 (14) (Jury in at 12 16)
 (15) MR O NEILL Plaintiffs call Roger Lohrer
 (16) THE CLERK Would you raise your right hand please
 (17) sir?
 (18) (The Witness Is Sworn)
 (19) THE CLERK Please be seated For the record sir
 (20) state your full name your address and spell your last name
 (21) please
 (22) THE WITNESS Roger Lohrer L O H R E R My address
 (23) is 2847 Northwest 62nd Seattle Washington
 (24) DIRECT EXAMINATION OF ROGER LOHRER
 (25) BY MR O NEILL

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- (1) Q And Mr Lohrer what do you do for a living?
 (2) A I m the owner of Dock Street Brokers
 (3) Q What does Dock Street Brokers do?
 (4) A We re the brokers for commercial fishing vessels and
 (5) limited entry permits
 (6) Q What does a broker do?
 (7) A A broker basically we act as a clearinghouse for buyers
 (8) and sellers of permits bring the buyers and sellers together
 (9) Q So if I wanted to sell my permit you re like a real estate
 (10) guy for permits?
 (11) A Exactly
 (12) Q And I could come to you and - and you d help me sell it
 (13) or if I wanted to buy a permit I could come to you and you d
 (14) help me buy it?
 (15) A Yes that s correct
 (16) Q Do you have any experience in the Alaska fishing industry
 (17) sir?
 (18) A Yes That is our primary area of operation
 (19) Q Have you yourself worked in the fishing industry?
 (20) A Yes I have I ran tenders in Alaska for approximately 15
 (21) years
 (22) Q And in what areas in Alaska?
 (23) A Chignik Kodiak and Southeast Alaska
 (24) Q And when you say you ran a tender a tender is the guy who
 (25) goes out and picks up the fish from the fishermen?

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- (1) A That s right and then delivers the fish back to the
 (2) cannery
 (3) Q How long have you been in the broker business?
 (4) A This will be our 17th years
 (5) Q And during those 17 years have you bought and sold
 (6) permits?
 (7) A Not personally but yes I have arranged sales
 (8) Q You have arranged sales of the permits?
 (9) A Yes that s correct
 (10) Q And of boats?
 (11) A Yes
 (12) Q And in what areas do you buy and sell permits?
 (13) A In every area in the state of Alaska as well as Washington
 (14) and down the coast
 (15) Q And how many employees does Dock Street Brokers have?
 (16) A During our normal selling season which is October through
 (17) June we have four full time employees
 (18) Q And have you sold limited entry permits for Upper Cook
 (19) Inlet drift and setnet gear types?
 (20) A Yes we have
 (21) Q And Prince William Sound various gear types in Prince
 (22) William Sound?
 (23) A Yes
 (24) Q Kodiak?
 (25) A Yes

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- (1) Q Chignik?
 (2) A Yes
 (3) Q Salmon and herring?
 (4) A Yes
 (5) Q Since 1990 1991 has there been a change with regard to
 (6) the frequency of sales and the prices for permits in Prince
 (7) William Sound Upper Cook Inlet Lower Cook Inlet Kodiak and
 (8) Chignik?
 (9) A Yes there has
 (10) Q And would you tell us about it?
 (11) A Since 1991 particularly after the release fish report 27
 (12) we ve seen a drastic drop in both the value of the permits
 (13) that would be the selling price as well as the number of the
 (14) permits we sell And we also see it taking a lot longer for us
 (15) to find buyers for permits in those areas
 (16) Q And so the permit prices have dropped?
 (17) A Yes that s correct
 (18) Q And it s harder to sell a permit out of those areas?
 (19) A Yes In some of the areas there s almost no market
 (20) whatsoever
 (21) Q And you said that that happened after fish study 27 or the
 (22) announcement of fish study 27?
 (23) A Yes We first started seeing it in the fall of 91 and
 (24) then that fall and then the following spring and winter so we
 (25) saw the drop really hit us

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- (1) Q And you ve worked in this area and talked to these people?
 (2) A Yes on a daily basis
 (3) Q And in sales negotiations for Prince William Sound salmon permits what reasons have buyers cited for not higher prices?
 (4) A The main thing we re hearing from the fishermen is they re concerned about the long term and short term effects of the oil spill and whether or not there s going to be sufficient runs or whether or not they re even going to have the opportunity to fish at all
 (10) Q And how about Kodiak?
 (11) A In Kodiak yes we re seeing the same general concerns from the fishermen
 (13) Q And with regard to Kodiak salmon seine prices for example what s happened to Kodiak salmon seine prices?
 (15) A In 1991 we were seeing prices in the range of 125 000 to \$140 000 and those prices now are down around 40 to \$50 000
 (17) Q And with regard to the sales negotiations for Kodiak salmon seine permits what reasons do permit buyers cite for not paying higher prices?
 (20) A The main concern is the long term effects of the oil spill on the fisheries
 (22) Q With regard to Prince William Sound herring permits what s happened with Prince William Sound herring permits?
 (24) A We ve seen a really radical drop there Those permits prior to 91 were almost impossible to find In 1991 92

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- (1) those permits were selling for approximately \$150 000 if you could find one to sell And this year they re trading for approximately \$50 000 right now
 (4) Q What reasons do buyers cite for not being - for attempting to drive the price down with regard to Prince William Sound herring permits?
 (7) A Again it s the effects on the oil spill on the herring the fact that we re seeing diseased herring or herring with lesions on them and lower quotas and just the runs appear to be in danger
 (11) Q Okay With regard to the numbers of permit sales the activity in permits -
 (13) A In all permits or just Prince William Sound herring seine?
 (14) Q Let s take Prince William Sound salmon permits
 (15) A That s probably the most drastic reduction on any permits that we ve seen in the state Those permits we ve sold them for as much as \$250 000 This year I believe we had three sales one I m just completing when I go back to my office tomorrow It is at 33 000 The other sales that we had this year were in the range of 50 to \$65 000 if you could find a buyer
 (22) Q With regard to the number of - the sales activity that you ve seen with regard to the various permits that we ve talked about compare if you would the sales activity in for example 1991 with the sales activity in 1993

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- (1) A Well not having the number offhand I can give you an approximation I would say that they are probably 25 percent of the total that they were prior to the -
 (4) Q So people are buying fewer permits?
 (5) A And paying less yes
 (6) Q And does it take more time to sell a permit now?
 (7) A Yes Typically Prince William Sound salmon seine for example if you could get one listing you know in October we would generally have those sold within a month or two sometimes within a day or two Now we ve had permits listed in Prince William Sound for both herring and salmon that have been listed for over a year without any offers at all
 (13) Q So people just won t buy them?
 (14) A That s right They re getting down to the point now where I think most of these buyers are speculators that are just hoping that you know something may happen or there may be an improvement but they re buying them and hanging on to them rather than even fishing them
 (18) MR O NEILL Thank you sir I have no further questions
 (21) THE COURT You may cross examine
 (22) CROSS EXAMINATION OF ROGER LOHRER
 (23) BY MR LYNCH
 (24) Q Hi Mr Lohrer
 (25) A Hello

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- (1) Q My name is Pat Lynch You indicated that your role is like that of a real estate agent real estate broker would be?
 (3) A Yes that s similar
 (4) Q And you cover - you sell permits or you broker permits for people in Alaska and you also do business in Washington and Oregon?
 (7) A Yes
 (8) Q And now in your experience first of all you see a wide variation in prices in areas outside of Alaska?
 (9) A You mean permits selling for instance in Washington do I see a wide variety in same type of permit?
 (12) Q In any given fishery in your experience is - from one transaction to the next for the same kind of permit in the same kind of fishery does it tend to jump up and down?
 (15) A Tends to be fairly constant over a reasonable period of time
 (17) Q Are you familiar with the CFEC statistics on Alaska permits?
 (18) A Yes We receive their regular reports
 (20) Q Your Honor I m looking for an exhibit which I may or may not have up here
 (22) Here it is Let me - may I approach Your Honor?
 (23) Let me hand you PX3647 for identification Do you recognize this document sir?
 (25) A I ve seen similar documents I don t recognize this

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- (1) particular one
 (2) **Q** Well this has been identified to us as a printout prepared
 (3) from CFEC data by plaintiffs for the purpose of trying to
 (4) estimate the losses that fishermen suffered on the sale of
 (5) various types of permits and the column headed cost you see
 (6) that?
 (7) **A** Yes
 (8) **Q** Are you able to identify the code on the front of the first
 (9) sheet? SO1E it looks like
 (10) **A** There s many of them You d have to help me with that
 (11) **Q** I m not sure I m able to identify it but I believe it to
 (12) be Prince William Sound seine a Prince William Sound seine?
 (13) **A** Salmon seine
 (14) **Q** Salmon seine permit is that right? I ve had that
 (15) confirmed
 (16) Would you look at that cost column for me? These are
 (17) the - or represented to be the official records kept by the
 (18) state board on the price at which permits have sold You see
 (19) the first one sold in June of 1989 and the price was 150 000?
 (20) **A** Yes
 (21) **Q** Then the next one is 100 000?
 (22) **A** Yes
 (23) **Q** The next one is 280 000?
 (24) **A** Yes I see that
 (25) **Q** Next one is 260 000?

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- (1) **A** Yes
 (2) **Q** Next one is 250 000?
 (3) **A** Yes
 (4) **Q** And 200 000?
 (5) **A** Yes
 (6) **Q** Then 150 000?
 (7) **A** Yes
 (8) **Q** Those transactions all occurred within the course of one
 (9) year correct?
 (10) **A** Yes
 (11) **Q** Range from a high of 280 000 to a low of 100 000?
 (12) **A** Yes
 (13) **Q** No two transactions at the same price?
 (14) **A** That s what it says here
 (15) **Q** No two transactions at a price less than a ten thousand
 (16) dollar differential right?
 (17) **A** Yes
 (18) **Q** Now those permits as I understand it are identical
 (19) insofar as the right they give the fisherman to engage in the
 (20) fishery?
 (21) **A** That s correct
 (22) **Q** Insofar as you re buying something when you buy the permit
 (23) each of them are buying exactly the same thing?
 (24) **A** That s correct
 (25) **Q** But they were paying sometimes 50 or a hundred thousand

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- (1) dollars difference in a matter of a couple months?
 (2) **A** That s what it says here
 (3) **Q** And you don t have any reason to doubt the accuracy of the
 (4) official records do you?
 (5) **A** Well there s a lot of - some of these transactions could
 (6) be made between family members
 (7) **Q** Okay
 (8) **A** Some of these transactions could be part of a package price
 (9) where there s a vessel and a permit In those kind of
 (10) transactions they tend to inflate the vessel price and deflate
 (11) the permit price
 (12) **Q** Let s take the first example you ve cited Family members
 (13) what would you expect if you learned they were transactions
 (14) between family members?
 (15) **A** It s hard -
 (16) **Q** Expect you weren t involved in the transaction?
 (17) **A** If it may be a transaction between a father and a son or
 (18) for instance there can be other considerations usually
 (19) they re lower
 (20) **Q** They re usually lower than market price?
 (21) **A** Yes
 (22) **Q** So for example maybe a father would say to his son if you
 (23) come to work with me for five years at the end of five years
 (24) when I m ready to retire I ll sell you the permit at some low
 (25) price?

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- (1) **A** Yes
 (2) **Q** Or maybe it s a transaction in which the owner of the
 (3) permit also wants to sell his boat?
 (4) **A** Yes
 (5) **Q** Or some recreational property down in southern California?
 (6) **A** Yes could be true
 (7) **Q** If you ll pay me a million dollars for the whole package
 (8) I ll give you the permit the boat and the recreational
 (9) property in southern California and I ll throw in two tickets
 (10) to Las Vegas as well correct?
 (11) **A** Yes
 (12) **Q** Now in that kind of a transaction your experience
 (13) does - do tax considerations come into play?
 (14) **A** Yes sometimes
 (15) **Q** Especially in the period from say 1989 1990 1991 could
 (16) you depreciate a salmon fishing permit?
 (17) **A** No
 (18) **Q** Maybe it would be helpful to explain what s the effect of
 (19) that? If I paid say \$280 000 for a salmon fishing permit and
 (20) I can t depreciate it what do I do with that on my tax return?
 (21) **A** You don t have any write-offs on that permit so you cannot
 (22) count it as an expense
 (23) **Q** So I m paying out to my bank or somebody out of my pocket
 (24) \$280 000 but I don t get to write it off is that correct?
 (25) **A** That s right

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- (1) Q If I make a deal to get the permit for a hundred thousand
 (2) dollars and I pay an extra 180 000 for the boat what s the tax
 (3) effect of that?
 (4) A You can write-off the boat but not the permit so you have
 (5) a tax advantage
 (6) Q So I get to take a tax deduction for an additional 180 000
 (7) if I can assign it to the boat?
 (8) A Yes
 (9) Q In your experience as a broker is that a pretty common
 (10) kind of arrangement for people to think about?
 (11) A It s fairly common Actually I think the entry
 (12) commission - you have to fill out a sworn statement on the
 (13) back of each permit of what the permit value was and what the
 (14) boat value was in the package transaction and the gear and I
 (15) think that they are - they scrutinize those pretty carefully
 (16) Q Have you ever had one rejected?
 (17) A Not to my recollection
 (18) Q Okay And certainly as a broker you would advise as a
 (19) broker you have a duty to the people you represent to structure
 (20) the best deal you can for them correct?
 (21) A Well on that type of a transaction we tell them right up
 (22) front to avoid a rejection that you know the market for the
 (23) value of the permit is X and you know you ve got to be
 (24) reasonable
 (25) Q You ve got to be reasonable?

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- (1) A You have to be reasonable
 (2) Q But you have a certain leeway to - even a tax man won t
 (3) object to a reasonable structure of the transaction isn t that
 (4) correct sir?
 (5) A Reasonable yes
 (6) Q May I approach Your Honor?
 (7) Let me show you PX515 for identification You recognize
 (8) that sir?
 (9) A Yes I do
 (10) Q I m going to take it back because it s the only copy I
 (11) have This is a report that you prepared for Mr O Neill and
 (12) his colleagues on valuation of permits?
 (13) A Yes
 (14) Q And you worked on that report with a Dr Karpoff?
 (15) A Yes I actually worked more closely with - his name
 (16) escapes me one of the other partners in the firm
 (17) Q Mr Freeberg?
 (18) A Yes Mr Freeberg and another gentleman also
 (19) Q Now in connection with preparing that report did you go
 (20) over these figures that have the actual sales transactions?
 (21) A I have never seen this exact type of report We get a
 (22) monthly or quarterly report of past sales which the entry
 (23) commission and the division of investment used for loan values
 (24) but I ve never seen a compilation like this
 (25) Q Well the monthly or the quarterly report that you get

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- (1) that s the one that s available to the general public correct?
 (2) A That s correct
 (3) Q That has sort of an average of prices?
 (4) A Yes I ve never seen this kind of variation on the reports
 (5) that we receive
 (6) Q So you in preparing the report that I just showed you
 (7) Exhibit PX515 for identification you didn t actually go over
 (8) the official transaction by transaction records?
 (9) A These were not available to us as far as I know What I
 (10) went over what we used occasionally was the monthly or
 (11) quarterly CFEC reports
 (12) Q When you say us are you referring to Dock Street Brokers
 (13) or are you referring to Natural Resource Consultants?
 (14) A I m referring to Dock Street Brokers
 (15) Q Natural Resource Consultants is who you worked with in
 (16) preparing that report correct?
 (17) A Yes
 (18) Q In that group they got the individual transaction records
 (19) from the government didn t they?
 (20) A I did not see them
 (21) Q You weren t shown them?
 (22) A No
 (23) Q Okay Now is it correct Mr Lohrer that based on your
 (24) experience you re not - you don t believe that comparing
 (25) prices in one - for licenses or permits in one fishery is

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- (1) necessarily a good idea in evaluating what prices are doing in
 (2) a different fishery?
 (3) A Well yes the potential income from a permit from all
 (4) areas is a consideration in determining the value of a given
 (5) permit
 (6) Q Well yes So the way you would think a buyer would look
 (7) at this sort of matter is that if the permit wouldn t generate
 (8) income sufficient to pay either a reasonable return on what he
 (9) was investing or help him meet his bank payments that
 (10) wouldn t
 (11) be a good deal for him?
 (12) A That s correct
 (13) Q So in that respect a buyer of a fishing permit is like
 (14) anybody who s making an investment right?
 (15) A Yes
 (16) Q They need to feel comfortable that they would be making a
 (17) reasonable return on their investment?
 (18) A I would assume that s why they re buying the permit yes
 (19) Q And you indicated that you re - what the people are saying
 (20) to you is they are concerned about the long term effects of the
 (21) spill correct?
 (22) A Yes
 (23) Q But that - what that - what their concern is whether
 (24) there are going to be enough fish there to catch to make money
 (25) right?
 (26) A Or whether they re going to be able to fish there at all

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- (1) Q Right but because they re concerned about whether they re making money right?
- (2) A Yes
- (3) Q They re also concerned are they not about price?
- (4) A Fish price?
- (5) Q Right For example in 1990 and 1991 fishermen in Prince William Sound were catching more fish than they knew what to do
- (6) with weren t they?
- (7) A Yes
- (8) Q They were throwing them overboard creating some kind of environmental questions about what happens when the fish gets
- (9) to the bottom but they couldn t do anything with it correct?
- (10) A I ve heard that yes
- (11) Q So there was plenty of fish but the price was so low that you couldn t even afford to take them back to the dock?
- (12) A There was - yes I heard that
- (13) Q So in that case if a person were looking at a Prince William Sound pink salmon fishing license his primary concern would not be whether he could catch fish because at least based on what s going on out there in the fishing grounds you can t - you could catch the fish with a - a bucket if you needed to right?
- (14) A Well yes but you know in Southeast Alaska for example they ve had the huge pink runs plenty of fish low price but the permit values are holding up very well

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- (1) Q So now is that - are you indicating that in Southeast then even though the price is low the permit values fishermen aren t concerned about whether they can make money on
- (2) their investment?
- (3) A They re concerned but I think that they feel that over the long haul they re going to be all right
- (4) Q Now you gave a deposition in this matter did you not sir?
- (5) A Yes I did
- (6) Q Let me see if I can find that here May I Your Honor?
- (7) I asked you if in your view it was appropriate to use one fishing area as a means of valuing the price at which a permit would transfer in another area and in fact in your view that is not appropriate isn t that correct sir?
- (8) A Would you repeat that again?
- (9) Q In your view it would not be appropriate to look at the price of say Southeast and use that as a basis for determining what would be a respectable price to expect in Prince William Sound?
- (10) A I think what I was saying was that because of the spill when you asked me whether or not low fish prices were what were
- (11) driving the price in Prince William Sound I said we have low fish prices in Southeast and the fisherman looks at the long term potential for the permit
- (12) Does that answer your question?

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- (1) Q I think it does in the sense of what the fisherman looks at
- (2) The question I was asking was a little bit different and that is in trying to determine how a price in one area would behave does it make any sense to look at a different fishing area and see how the permit is doing there?
- (3) And I understood you to testify at your deposition the way I read it you didn t think that was the appropriate thing to do because each fishing area has its own characteristics and that makes a different market in each place?
- (4) A I don t quite understand what your question is
- (5) Q Let me try to use real estate as an analogy I m not an Alaska regular but I picked up a couple of names if you had a house say in Eagle River and you wanted to know what a house in Wasilla would be worth one way to look at that question would say what - what s a similar house selling for in Eagle River correct?
- (6) A Yes
- (7) Q That s done sometimes right?
- (8) A Yes
- (9) Q Now if you had a fishing permit in Prince William Sound the question was do you think it makes sense to go look at Bristol Bay permits to see how they re doing in order to predict how fishing permit prices would go or might go in Prince William Sound And I understood that you testified at your deposition you didn t think that was a good idea?

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- (1) A Well looking at it as a business venture I think it s a fair comparison to look at each area
- (2) Q Would you look at your deposition at Page 222? I found when I looked at my copies that the way these things are numbered may not be entirely consistent Have you got it there sir?
- (3) A Yes I do
- (4) Q I m going to start reading at line 21 this question was asked For purposes of analyzing the issue of whether the spill impacted permit prices in general do you think it s appropriate to analyze the performance of permits in the non spill affected areas versus the spill affected areas?
- (5) Answer not necessarily no
- (6) Were you asked that question and did you give that answer?
- (7) A Yes
- (8) Q And then you were asked why not
- (9) Answer I think there s too many variables It s just too big - too big of a stretch to say that permit values in Southeast went down the same years that Prince William Sound went down There happened to be an oil spill therefore we conclude that there was no effect on permit prices in Prince William Sound I think that s too big a stretch There are too many factors to make that kind of conclusion
- (10) Were you asked that question and did you give that answer sir?

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- (1) A Yes
 (2) Q And it is your experience is it not for example that
 (3) Bristol Bay fishery is a unique fishery?
 (4) A Yes
 (5) Q Uniquely short seasoned?
 (6) A Yes
 (7) Q And that there are a lot of sort of quasi fishermen in
 (8) Bristol Bay?
 (9) A Fishermen that fish for a month or two yes
 (10) Q Fishermen who are so obviously unqualified to operate that
 (11) attorneys buy fishing permits in Bristol Bay?
 (12) A There s some very good attorneys fishing in Bristol Bay
 (13) Q I m sure there s some good attorneys but are there any
 (14) good fishermen?
 (15) A Attorney fishermen
 (16) Q Anything can happen lightning can strike but it is your
 (17) experience that there s kind of unusual experience in Bristol
 (18) Bay that attorneys and others invest in sort of a second job
 (19) on a second job basis?
 (20) A That is correct
 (21) Q You find that to be unique about Bristol Bay in the places
 (22) you work isn t that correct sir?
 (23) A And some places in Bristol Bay yes
 (24) MR LYNCH Thank you Mr Lohrer I don t have any
 (25) other questions

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- (1) MR O NEILL Thank you Mr Lohrer
 (2) THE COURT You may step down sir
 (3) Call your next witness
 (4) MR SARKO Your Honor Rosaleen Moore
 (5) THE CLERK Raise your right hand
 (6) (The Witness Is Sworn)
 (7) THE CLERK Please be seated For the record please
 (8) state your full name your address and spell your last name
 (9) please
 (10) THE WITNESS Rosaleen Moore and I live at 41980
 (11) Katchimak Drive Homer Alaska
 (12) THE CLERK Could you spell your last name please?
 (13) THE WITNESS Oh excuse me M O O R E
 (14) DIRECT EXAMINATION OF ROSALEEN MOORE
 (15) BY MR SARKO
 (16) Q Good afternoon Ms Moore My name is Lynn Sarko I m
 (17) one
 (18) of the plaintiff attorneys
 (19) Could you tell us how long you ve lived in Alaska?
 (20) A I was born in Anchorage and I ve lived in Alaska my entire
 (21) life
 (22) Q What do you now do?
 (23) A I m having a little trouble hearing Must be a fan or
 (24) something
 (25) Q What do you now do?
 (26) A I m a commercial fisherman and I also own a boatyard and

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- (1) storage facility with my husband and a boat brokerage in
 Homer
 (2) Q I understand that you actually have quite a background in
 (3) commercial fishing?
 (4) A I ve fished in Alaska all my life My parents owned setnet
 (5) sites in Cook Inlet since 1939 I imagine I picked my first
 (6) fish when I was learning to walk I ve - I personally have -
 (7) is that okay?
 (8) I ve personally fished Cook Inlet setnet Cook Inlet drift
 (9) False Pass drift Bristol Bay drift Prince William Sound
 (10) herring My husband has fished in three of the major seine
 (11) fisheries two of the gillnet fisheries and crab fisheries of
 (12) Alaska and my children fish also
 (13) Q Wow I want to get into just briefly some of your
 (14) background You re a past board member of CFAB correct?
 (15) A Yes that is correct
 (16) Q That s a new term Can you explain to the jury what CFAB
 (17) is?
 (18) A CFAB is Alaska Commercial Fisheries and Agricultural Bank
 (19) It is a private cooperative It was funded by the State of
 (20) Alaska to loan and then has leveraged money outside of the
 (21) state to loan to commercial fishermen and the agricultural
 (22) industry in Alaska
 (23) Q Do I also understand that you re a board member of United
 (24) Fishermen of Alaska?
 (25) A I ve been a board member several times of the United

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- (1) Fishermen of Alaska and I am presently a member
 (2) Q And what is that?
 (3) A It is a united - it basically handles political action in
 (4) the state and board members are made up throughout the state
 (5) from different areas and different fisheries groups and kind of
 (6) a watchdog of politics of Alaska fisheries
 (7) Q During your time in commercial fishing have you personally
 (8) sold and bought various vessels and permits?
 (9) A My husband and I personally since 1966 sold and owned 17
 (10) different vessels We also have sold our own permits in many
 (11) of the areas and transferred to different areas
 (12) Q I d like to get into your line of work You are a
 (13) commercial permit broker correct?
 (14) A Yes I am
 (15) Q And the name of your business is?
 (16) A Northern Enterprises
 (17) Q And how long has that business been - how long have you
 (18) been involved in this?
 (19) A I started the brokerage business in 1981
 (20) Q And is the business with your husband?
 (21) A He does very little in the brokerage business It s really
 (22) my own
 (23) Q Let me just quickly get to the subject at hand You ve
 (24) sold limited entry permits and I would just like to review in
 (25) what areas

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- (1) A The areas that our business sells permits in is Prince
 (2) William Sound Cook Inlet Kodiak Alaska Peninsula and Bristol
 (3) Bay We do some work in Southeast but geographically since
 (4) we re located here north we do very little The other ones
 (5) are where our primary business is and Cook Inlet is our real
 (6) primary - I mean it s where we sell the most
 (7) Q The jury has heard the mention of fish study number 27
 (8) Since 1991 when that came out have you seen a change in the
 (9) price of permits that you ve been involved with in your
 (10) business that have been bought and sold since the release of
 (11) that study?
 (12) A Well the information on the study started coming out in
 (13) the fall of 91 and the actual study came out just after the
 (14) first of the year in 92 When that word came out and started
 (15) getting onto the street basically that Cook Inlet would have
 (16) very little fishing in 94 95 and 96 permit prices started
 (17) to drop drastically I personally had some concerns and gave a
 (18) call to a biologist about it that fall
 (19) Q And the permit buyers and sellers that you dealt with
 (20) raised this as a concern?
 (21) A Repeat the last -
 (22) Q The permit buyers and sellers that you were involved with
 (23) spoke about this to you?
 (24) A Yes they did I probably deal - we store 500 boats
 (25) Half of those are from Cook Inlet so on a daily basis and a

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- (1) yearly basis I must talk to thousands of fishermen and in the
 (2) Cook Inlet area probably you know couple hundred in a year
 (3) And they were very concerned about what their future held for
 (4) them and would they be able to make a living in the fishing
 (5) industry
 (6) Q Let me move on to Prince William Sound Did - what
 (7) happened to permit prices in Prince William Sound?
 (8) A Permit prices in Prince William Sound actually started to
 (9) decline right at the oil spill The one area that dipped
 (10) immediately and started going down and just furtherly
 (11) especially the seine permit eroded The drift permit went
 (12) too down and kind of went across the board for a while and
 (13) now
 (14) it s went down even more
 (15) Q What types of concerns did Prince William Sound buyers
 (16) voice to you?
 (17) A Well the first few years or right after the oil spill I
 (18) had many complaints that they couldn t even get loans and to
 (19) even buy anything So that started the first erosion and they
 (20) just don t know what the long term effects are of the oil The
 (21) herring fishery has been closed for two years due to lesions on
 (22) the fish The salmon fishery last year guys did not even
 (23) break even I know of only one person that had any substantial
 (24) pounds and he was the only one practically fishing in the
 (25) Sound And he stayed over there and scratched it out but the
 rest could not even make their payments Our son in law did

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- (1) not even go because of it
 (2) Q These were concerns that were being raised to you?
 (3) A These were concerns They talk about it daily They
 (4) just - what are we going to do you know
 (5) Q You mentioned the term lending and I d just like to briefly
 (6) touch on that Do you have dealings with the State of Alaska
 (7) Department of Investments in connection with the financing and
 (8) purchasing of limited entry permits?
 (9) A Yes we do They financed the primary amounts of permits
 (10) in Alaska to state residents
 (11) Q And you briefly discussed what CFAB was?
 (12) A Yes
 (13) Q Are you familiar with those lending requirements?
 (14) A I m real familiar with it We do loan preparation along
 (15) with the sales of permits
 (16) Q And have you observed the lending requirements change
 (17) since
 (18) January of 92?
 (19) A Yes I have After the report came out fish study 27 the
 (20) State of Alaska issued a directive that they were drastically
 (21) going to reduce the amount of money they loaned into the Cook
 (22) Inlet and Prince William Sound fisheries Before they would
 (23) loan 90 percent of the appraised value of the fishery and 80
 (24) percent if you had additional collateral
 (25) After the directive came out it was 50 percent You had
 to come up with 50 percent of the cash in order to buy a permit

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- (1) in those areas
 (2) Q And in connection with those lending requirement changes
 (3) the effects that you ve mentioned have been voiced as to what
 (4) was the effect on the fisheries?
 (5) A Yeah fisheries families basically no longer could - even
 (6) if they had some confidence which they don t no longer would
 (7) have the capital to enter into the fisheries and they re very
 (8) concerned about it and the lending institutions did not want
 (9) to have anymore loans on the books that weren t well financed
 (10) and had a lot of collateral because they knew they were going
 (11) to have enough trouble with the ones they already had on the
 (12) books
 (13) Q Let me just quickly go over some of the various permit
 (14) areas Starting with Cook Inlet can you tell me what you ve
 (15) observed happening there in prices the market how quickly
 (16) the
 (17) permits have sold and whether there is a market?
 (18) A Well prior to about 91 it - I think Roger and I
 (19) probably both had to stay awake nights to see who was going
 (20) to
 (21) get the sales It was an absolute frenzy If I got a permit
 (22) on the table or on the desk from somebody I d probably have it
 (23) sold in 24 hours to 48 hours and we were looking for permits
 (24) constantly because we had a large list of buyers After that
 (25) we have a large list of sellers and very few buyers
 Q And the prices have plunged?
 A The price in 1980 - 1990 excuse me one was over \$200 000

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- (1) and I had people standing in line to buy them And the last
 (2) permit we closed for Cook Inlet was 58 000 and that was a
 month
 (3) ago
 (4) Q Let me ask -
 (5) A That was for Cook Inlet drift
 (6) Q Let me ask you about Prince William Sound salmon permits
 (7) There s been a change there also?
 (8) A There s been a drastic change Right at the oil spill I
 (9) had several contracts of prices around \$300 000 for Prince
 (10) William Sound salmon seine and we recently closed a permit I
 (11) think it was April 30th for 34 500 On the same day CFAB
 (12) auctioned a permit off that bought basically the same price
 (13) and so did the State of Alaska And those were foreclosed
 (14) permits and the one I sold was involved in a bankruptcy
 (15) Q And there similarly has been a change in the number of
 (16) people who wanted to buy permits to now the few people who
 (17) want to buy permits?
 (18) A The numbers are drastic and also the make up is drastic I
 (19) just don t have very many I used to have pages of people that
 (20) wanted to buy permits in any area of Alaska and now it s - you
 (21) can advertise a permit in almost any of these areas for months
 (22) and not get anybody to come up to it They re all looking for
 (23) bargains and if they do put their name down they say well
 (24) if the Sound permit reaches 25 give me a call if Cook Inlet
 (25) reaches 45 give me a call They just aren t interested and

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- (1) they are - I guess they re investment seekers they re not
 (2) really fishermen anymore
 (3) Q When you say - just to be clear when you say these areas
 (4) are having trouble selling permits these are the oiled areas?
 (5) A That s right It s Prince William Sound Cook Inlet
 (6) Kodiak It is not the Alaska Peninsula and it is not Bristol
 (7) Bay
 (8) Q Let me take you to Prince William Sound herring Is there
 (9) a similar problem with selling those permits?
 (10) A Yeah Prince William Sound herring sold for \$250 000 and
 (11) now there s nobody that wanted one I heard of one that sold
 (12) for 70 but I did not personally handle that in our office and
 (13) there s just no - you know who wants to buy into a fishery
 (14) you re not going to fish?
 (15) Q And lastly are you seeing the same problems in Kodiak
 (16) salmon permits?
 (17) A I have permits listed for Kodiak for 40 000 and I can t
 (18) sell them There are no buyers
 (19) Q And there s been a drop in those -
 (20) A The high was \$180 000
 (21) MR SARKO I have no further questions
 (22) THE COURT You may cross examine
 (23) CROSS EXAMINATION OF ROSALEEN MOORE
 (24) BY MR RUSSO
 (25) Q Good afternoon Ms Moore My name is Tom Russo I

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- (1) represent Captain Hazelwood in this case and I d like to ask
 (2) you a few questions
 (3) A Probably the reason I can t hear very well is a lot of
 (4) diesels over the years
 (5) Q I ll try and keep my voice up
 (6) A As long as it s in the mike I m okay I m not quite to
 (7) the hearing aid but we re close
 (8) Q If you have any trouble hearing me let me know
 (9) You described your business as a fish permit broker In
 (10) addition to that though you have other businesses correct?
 (11) A We have a storage and repair yard and also I commercial
 (12) fish
 (13) Q Traditionally what proportion of your business is the
 (14) brokerage business as opposed to the other?
 (15) A In what define net income gross income?
 (16) Q We ll do it both ways How about net income?
 (17) A The brokerage
 (18) Q What about gross income?
 (19) A The yard
 (20) Q Now in conjunction with this yard that you have I take it
 (21) this yard is in Cook Inlet?
 (22) A Yes it is It s located in Homer
 (23) Q And most of the people that deal with you in conjunction
 (24) with the yard are fishermen?
 (25) A I d say 95 percent are commercial fishermen and the five

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- (1) percent are charter boat owners and private vessel owners
 (2) Q The fishermen that deal with you in this yard are they for
 (3) the most part fishermen that have claims in this case?
 (4) A That s probably right
 (5) Q And you re also a fisherperson is that correct?
 (6) A Yes
 (7) Q You also have a claim in this case?
 (8) A I have a claim in this case on a Prince William Sound
 (9) herring permit
 (10) Q And your husband is also a fisherman?
 (11) A My husband is no longer fishing
 (12) Q He was a fisherman?
 (13) A He fished in Prince William Sound
 (14) Q He also has a claim in this case?
 (15) A Yes - yes he does
 (16) Q And your son is also a fisherman?
 (17) A Yes he is
 (18) Q And he also has a claim in this case?
 (19) A Yes He fishes Prince William Sound salmon seine
 (20) Q Now as a broker on these fish permits and I know it s
 (21) been - some people have said it s like selling real estate
 (22) but bear with me if I ask you a few preliminary questions as to
 (23) how this works
 (24) When you are selling the fish permit do you represent the
 (25) buyer or the seller?

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- (1) A It depends
 (2) Q You represent both?
 (3) A Could be either way It depends on the situation
 (4) Depends
 (5) Q Do you ever represent both buyer and seller?
 (6) A It s - if a seller comes to us and we have a signed
 (7) contract on a permit I m representing the seller If a permit
 (8) buyer comes to me and asks me to go look for a permit and
 (9) offers a fee for that I m representing him
 (10) Q In conjunction with the permits that you ve sold have you
 (11) mostly represented sellers or mostly represented buyers?
 (12) A Mostly represented sellers
 (13) Q Okay And in conjunction with selling permits for sellers
 (14) do you get paid a commission?
 (15) A Yes I do
 (16) Q What percentage is that?
 (17) A It s two percent
 (18) Q Two percent of the selling price?
 (19) A Sale price on a permit Vessels vary
 (20) Q When you represent a buyer what percent commission do
 (21) you -
 (22) A Usually a flat fee and then I ll have a percentage on the
 (23) sale too
 (24) Q Which is what?
 (25) A It varies There is no - anywhere from 500 to \$2 000

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- (1) Q Okay Now as far as selling permits go would you agree
 (2) with the proposition that there are multiple factors which
 (3) would go into the value of a permit for sale?
 (4) A Supply and demand is the main factor
 (5) Q In addition to supply and demand though there would be
 (6) other factors wouldn t there?
 (7) A No I d say supply and demand is the main factor that I ve
 (8) seen
 (9) Q What about price of fish? Would that be a factor at all in
 (10) your estimation as to the price of the fish permit?
 (11) A More of what is a value based on value and how stable runs
 (12) are because fish prices from one area to another like False
 (13) Pass and Bristol Bay have not affected the price of the
 (14) permits
 (15) Q Okay But so just so I understand this is it your
 (16) testimony that you don t believe that the - that the price of
 (17) fish has any effect on a fish permit price?
 (18) A Very very little
 (19) Q So in other words you do believe it has an effect but you
 (20) believe it has a very very little effect?
 (21) A Yes and I could probably explain why
 (22) Q No Now you mentioned fish study 27?
 (23) A Roger
 (24) Q Remember that? Do you recall when the newspaper articles
 (25) on fish study 27 appeared?

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- (1) A They came out right after the first of the year in 92
 (2) but I don t have the date
 (3) Q Would February of 92 be a date consistent with your
 (4) recollection?
 (5) A That s correct but the word was on the street in the fall
 (6) Q But any case the newspaper articles relevant to that study
 (7) first appeared in approximately February of 1992 is that
 (8) correct?
 (9) A I think that s approximate
 (10) Q Now I believe you mentioned on your direct examination
 (11) that one of the things that you noticed in 91 was that there
 (12) was a drastic reduction in the number of permits sold?
 (13) A It started in 91
 (14) Q And do you recall how many permits you were involved in
 (15) selling how many Cook Inlet drift permits you sold in 1991?
 (16) A I believe the number was 15
 (17) Q 15? All right And do you recall how many permits you
 (18) sold in 1992?
 (19) A The number had went down and I believe it was about 10
 (20) Q I d like to just show you a document to see if it refreshes
 (21) your recollection relative to the sales of Cook Inlet drift
 (22) permits in 1991 Okay This a DX9344 Just take a look at
 (23) that
 (24) Did you look at it?
 (25) A Yes I have

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- (1) Q Does that refresh your recollection as to the number of
 (2) sales that Northern Enterprises had of Cook Inlet drift permits
 (3) in 1991?
 (4) A I believe this was permits sold by themselves not with
 (5) vessels
 (6) Q All right How many was - how many were those in 1991?
 (7) A I counted this real quick here Let s see Seven -
 (8) eight Eight
 (9) Q Eight okay And how many of those permits were sold by
 (10) your company Northern Enterprises in 1992?
 (11) A Well these are permits that are - this list I believe
 (12) consists of permits that were sold by themselves not with
 (13) vessels
 (14) Q All right With that qualification
 (15) A Okay Nine
 (16) Q So then - give that back to me
 (17) A Okay
 (18) Q Thanks Thank you So with the qualification that you
 (19) just made then is it fair to say that at least insofar as
 (20) permits for Cook Inlet drift permits sold without vessels you
 (21) sold approximately the same amount of permits in 1991 as you
 (22) did in 1992?
 (23) A Yes
 (24) Q Now I think there was some testimony from the - from the
 (25) gentleman that testified previous to you - you were in court

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- (1) when he testified?
 (2) A Yes I was
 (3) Q About some tax advantages of selling permits in conjunction
 (4) with vessels and distributing the cost between the permits and
 (5) the vessels did you hear that testimony?
 (6) A Yes I did
 (7) Q In your practice as a broker have you been involved in
 (8) sales where vessels have been sold in conjunction with
 permits?
 (9) A Yes I have
 (10) Q And in conjunction with that have you ever seen situations
 (11) where the prices of the vessel or the permits have been
 (12) adjusted in such a way to create a tax advantage for the
 (13) buyer?
 (14) A I'd say it's more like this When there is a permit and
 (15) boat and gear and stuff sold together the permit will bring
 (16) less money in that sale and the reason is - is a tax
 (17) reason Most sellers will try to negotiate the deal that the
 (18) sale price of the vessel will match what the survey values that
 (19) they have on their boats that have been made by surveyors are
 (20) and - for that reason
 (21) Q Okay We discussed just briefly some of the factors that
 (22) go into permit prices Are you aware of situations where
 (23) people make sales of permits for the purposes of making a
 (24) lateral move like moving to another fishery?
 (25) A Yes I am I've done that a lot

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- (1) Q And is it a fact that at some time in those cases
 (2) generally speaking a seller will sell a permit for less than
 (3) the market value in order to be able to move on to another
 (4) fishery?
 (5) A I have not had to do that but for about oh a year ago
 (6) people bailing out of Cook Inlet in order to move into Bristol
 (7) Bay
 (8) Q But you have heard of that happening?
 (9) A I personally have not been involved in it no I - I
 (10) don't think it was ever necessary until in maybe the last
 (11) couple years and a few people did go five \$10 000 cheaper on
 (12) a Cook Inlet in order to have the cash in order to buy a
 (13) Bristol Bay permit and that was where I seen it the most and
 (14) only in a few incidents
 (15) I mean it'd be like selling a house in Anchorage in order
 (16) to move to Florida You need to move might sell this one
 (17) cheaper to get out
 (18) MR RUSSO I have no further questions Thank you
 (19) MR SARKO Your Honor just a couple follow up
 (20) questions
 (21) REDIRECT EXAMINATION OF ROSALEEN MOORE
 (22) BY MR SARKO
 (23) Q Let me start with Cook Inlet drift permits Since the date
 (24) of the oil spill what was the highest sale price you had?
 (25) A 230 000

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- (1) Q And what are they selling for now?
 (2) A 58 000
 (3) Q Cook Inlet setnet permit what's the high?
 (4) A 110
 (5) Q What's it selling for now?
 (6) A 22 500
 (7) Q Cook Inlet herring since the oil spill the high?
 (8) A 250 and I believe it was 75
 (9) Q Cook Inlet salmon seine?
 (10) A 180 and I can't sell them There is no market
 (11) Q Prince William Sound drift?
 (12) A 180 and 65 000 recently
 (13) Q Prince William Sound herring seine?
 (14) A 250, and 70 000 recently but they're not selling
 (15) Q Prince William Sound salmon seines?
 (16) A 308 and 34 500 is one of the most recent transactions we
 (17) have
 (18) Q What about Kodiak salmon seine?
 (19) A 180 000 40 000 is the market and there's no buyers
 (20) MR SARKO No more questions
 (21) THE COURT Thank you You may step down
 (22) You may call your next witness
 (23) MR SARKO Dr Karpoff
 (24) THE CLERK Would you raise your right hand please
 (25) sir?

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- (1) (The Witness Is Sworn)
 (2) THE CLERK Please be seated For the record sir
 (3) state your full name your address and spell your last name
 (4) please
 (5) THE WITNESS My name is Jonathon Karpoff I live at
 (6) 1828 Northeast Revenna Boulevard in Seattle Washington
 (7) THE CLERK Could you spell your last name please?
 (8) THE WITNESS K A R P O F F
 (9) DIRECT EXAMINATION OF JONATHON KARPOFF
 (10) BY MR SARKO
 (11) Q Dr Karpoff where are you employed?
 (12) A I work at the University of Washington's school of
 (13) business
 (14) Q And are you married?
 (15) A Yes
 (16) Q Do you have children?
 (17) A I have two daughters 11 and almost 7
 (18) Q Let me ask you a couple of questions about your
 (19) background Where did you go to school?
 (20) A Went to school - where do you want me to start?
 (21) Q Well let's start - where did you go to school in high
 (22) school?
 (23) A I graduated from high school from West Anchorage High
 (24) School went to college at the University of Alaska in
 (25) Anchorage and went to graduate school at UCLA

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- (1) Q What did you study at - what did you get your BA in?
 (2) A In economics
 (3) Q In economics And your graduate degree?
 (4) A My graduate degrees are both in economics
 (5) Q Did you specialize in any particular type of area in
 (6) graduate school?
 (7) A Yes I specialized in four areas development economics
 (8) industrial organization financial economics and natural
 (9) resource economics I - my career has focused on the last two
 (10) of those
 (11) Q And in graduate school did you do a dissertation?
 (12) A Yes
 (13) Q And what was the dissertation subject?
 (14) A The subject of the dissertation was the Alaska salmon
 (15) fisheries and in particular the limited entry permit system
 (16) I spent quite a bit of effort trying to value and figure out
 (17) how to value limited entry permits
 (18) Q Dr Karpoff you re at the University of Washington
 (19) correct?
 (20) A Yes
 (21) Q And do I understand that you were the director of the
 (22) University of Washington MBA environmental management
 program?
 (23) A Yes We started the environmental management program in
 (24) 1991 something that the school s quite proud of It was the
 (25) first in the nation I was the initial director I stepped

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- (1) down in 1993 as director but continued a teaching program
 and
 (2) also served on the steering committee
 (3) Q You might need to pull the microphone a little closer
 (4) Your Honor can I approach and retrieve some exhibits?
 (5) Thank you
 (6) Doctor it seems that professors have a habit of writing
 (7) articles Have you written any articles or published anything?
 (8) A Yes
 (9) Q And what areas?
 (10) A In a number of areas The ones that are probably most
 (11) relevant for this case are on fisheries fisheries regulation
 (12) and in particular the Alaska limited entry system and
 (13) valuation of limited entry permits
 (14) Q Let me go back After you received your degree could you
 (15) sort of bring us up to present in your employment history?
 (16) A I worked - while working on my dissertation I worked
 (17) teaching part time at the University of Alaska at Anchorage and
 (18) I also worked for the Commercial Fisheries Entry Commission
 (19) Going on the job market I had to leave Alaska to take a
 (20) job offer that I couldn't refuse at the University of
 (21) Washington and I have been there since
 (22) Q Just as a quick review what is the Commercial Fisheries
 (23) Entries Commission?
 (24) A The Commercial Fisheries Entry Commission now is a
 division
 (25) in the State s Department of Fish and Game It is charged with

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- (1) overseeing managing the limited entry system as it has been
 (2) applied in the Alaska salmon fisheries and now many other
 (3) fisheries
 (4) Q Have you also been a principal investigator for NOAA?
 (5) A Yes As part of my research I once was supported through
 (6) a grant from the Washington sea grant program which comes
 (7) through NOAA
 (8) Q In the area - I guess to sum up the work that you ve done
 (9) since you ve come to the University of Washington a
 (10) substantial part of that has actually involved analyzing
 (11) limited entry permits and the economic issues involved?
 (12) A Yes
 (13) MR SARKO Your Honor the plaintiffs would offer Dr
 (14) Karpoff as an expert in economics and valuation of limited
 (15) entry permits in Alaska
 (16) MR LYNCH Your Honor the second subject I have no
 (17) problem with The first seems awfully broad Do you want to
 (18) delete -
 (19) THE COURT I suspect he s going the talk about the
 (20) latter subject I ll accept the witness qualifications
 (21) MR LYNCH That s what I expected too Your Honor
 (22) BY MR SARKO
 (23) Q Dr Karpoff in the interest of time the jury - you ve
 (24) been here today and we ve already heard a couple of permit
 (25) brokers speak a little bit about the subject so let s - I d

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- (1) like to review but not spend too much time
 (2) We ve heard a little bit about the limited entry permit
 (3) system Could you just give us a brief overall explanation of
 (4) how it works as it would relate to valuation of permits?
 (5) A Yes Since it was passed in 1973 and applied to many
 (6) fisheries in Alaska the limited entry system requires that the
 (7) fishermen have in addition to vessel and gear a permit to
 (8) participate in the fishery The fishery is limited in the
 (9) sense that there are only a fixed number of permits issued
 (10) So for example a fisherman that wants to enter a fishery
 (11) must acquire a permit in addition to acquiring a vessel and
 (12) gear Likewise a fisherman must seek - fisherman who s
 (13) willing to sell and wants to leave the fishery has not only
 (14) valuable vessel and gear to sell but a valuable asset in the
 (15) form of a limited entry permit
 (16) What I think is important is that when buyers and sellers
 (17) get together the price of the permit reflects the long term
 (18) value of income that can be earned from participating in the
 (19) fishery Common sense for example would suggest that
 (20) fishermen would be willing to pay relatively large amounts of
 (21) money if the income that can be earned from participating in
 (22) the fishery is high and if the prospects are dismal on the
 (23) other hand fisherman would be willing to pay less
 (24) And in fact I think this common sense is - is consistent
 (25) with and is formalized in well established economic principles

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- (1) that show that the value of a permit reflects exactly the value
 (2) of expected future fishing incomes
 (3) Q Dr Karpoff so I understand what you re saying is what
 (4) gives a permit value is the right to earn the income in the
 (5) future?
 (6) A Exactly
 (7) Q And is there a relationship between the future income that
 (8) would be earned in the fishery and the value that I would pay
 (9) for a permit?
 (10) A Yes In fact the permit price is a barometer of the
 (11) health of the fishery One way that one could think about this
 (12) is that if we wanted to figure out what the long term impact on
 (13) future fishing incomes is from the Exxon Valdez oil spill we
 (14) could go through a very complicated and I think a process
 (15) that I think would be prone to error where we hire a lot of
 (16) experts to project future fishing prices 10 20 years in the
 (17) future or harvest five 10 20 years into the future and
 (18) fishing costs far into the future That process would be very
 (19) difficult to estimate the economic damage to participating
 (20) fishermen
 (21) What we have instead is a relatively easy way to find out
 (22) what fishermen themselves think the economic damage of the
 (23) fish - to the fishery is We can look at permit prices We
 (24) have through permit prices a market estimate of the long term
 (25) impact of the spill

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- (1) Q Let me briefly take you through - could you explain to us
 (2) how permits are traded? We ve heard two brokers talk about
 (3) that and some comparison to perhaps real estate but how -
 (4) how
 (5) are permits traded?
 (6) A Permits -
 (7) Q What is the market?
 (8) A There s a very well developed and sophisticated market for
 (9) trading permits Many permits are traded through family
 (10) contacts others through advertising advertisements and many
 (11) through brokers We ve just heard from probably the two most
 (12) widely known and respected brokers
 (13) Q So there is a formalized market with formalized prices?
 (14) A The market is formalized in the sense that buyers and
 (15) sellers are both interested in getting the best deals that they
 (16) can There are in normal times a fairly large number of
 (17) potential buyers and a fairly large number of potential
 (18) sellers
 (19) Q Is there a system to record the price at which permits are
 (20) traded?
 (21) A Yes The Commercial Fisheries Entry Commission requires
 (22) that people who engage in buying and selling the permits fill
 (23) out survey forms and on the survey forms the price of the
 (24) transaction is recorded The Commercial Fisheries Entry
 (25) Commission then keeps track of all of these transactions and
 the related prices

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- (1) Q Have you had the opportunity to investigate or look at the
 (2) pricing of permits in Alaska during and since the oil spill?
 (3) A Yes
 (4) Q Has there been a change in permit prices in Prince William
 (5) Sound Cook Inlet and Kodiak since the Exxon Valdez oil spill?
 (6) A Yes particularly when you look at the six salmon fisheries
 (7) that have been discussed previously two in Prince William
 (8) Sound one in Kodiak three in Cook Inlet And also on the
 (9) Prince William Sound herring seine fishery permit prices have
 (10) gone down quite dramatically and furthermore they have
 (11) gone
 (12) down compared to what we can reasonably expect them to
 (13) have
 (14) been absent the spill
 (15) Q Let me show you an exhibit and ask you in connection with
 (16) it was a model prepared a statistical model to attempt to
 (17) measure the impact of the Exxon Valdez oil spill on permit
 (18) prices in the oiled regions? And perhaps - this is Exhibit
 (19) 523 You might use it to explain that model
 (20) A This is a graph that shows the effect of the oil spill on
 (21) the value of Prince William Sound salmon purse seine
 (22) fisheries - permits excuse me It s the result of a modeling
 (23) exercise that was put together by Natural Resource Consultants
 (24) and which I reviewed in the development of the model and with
 (25) which I agree
 Thank you in the graph actual permit prices are traced
 over time - excuse me does this - thank you

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- (1) Actual permit prices are traced over time using this green
 (2) line from 1989 through 1993 the last - using the last data
 (3) that are available from the Commercial Fisheries Entry
 (4) Commission
 (5) The blue line represents the value of the permits that
 (6) could reasonably be expected absent the spill In constructing
 (7) estimates of the predicted value of the - of the permits
 (8) absent the spill what Natural Resource Consultants did was to
 (9) compare each oiled fishery with a similar non oiled fishery and
 (10) compare the actual permit price change in the - excuse me in
 (11) the oiled fishery with the percentage price change in the
 (12) non-oiled fishery
 (13) The blue line is constructed by applying the percentage
 (14) changes in the permit values of the comparison non-oiled
 (15) fishery The difference between the blue line and the green
 (16) line is the estimate of the effect of the oil spill on permit
 (17) values So for example if we look - I m sorry this is not
 (18) working huh?
 (19) Q There you go
 (20) A Thank you If we - if we look at the predicted versus the
 (21) actual values of these permits in 1993 you can see that Prince
 (22) William Sound percent seine permits were actually selling at
 (23) below a hundred thousand dollars around \$90 000 The
 (24) predicted value absent the spill based on what was happening
 (25) to permit values in another comparable benchmark fishery was

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- (1) much higher in the neighborhood of 230 \$240 000 The
 (2) difference in this case \$146 000 is the amount that s
 (3) attributed to the damage of the oil spill
 (4) Again it reflects the value in today s dollars of
 (5) fisher - fishermen and fisherwomen s expectations of the lower
 (6) fishing incomes that they expect to earn
 (7) Q Dr Karpoff just to make sure I understand what you did
 (8) was you had an oiled fishery say Prince William Sound and a
 (9) certain permit type and you tried to find comparable - and
 (10) we ve used a real estate example a comparable house another
 (11) fishery that you could use to compare it to?
 (12) A Yes
 (13) Q And then you - you looked and observed to see how they
 (14) moved in relationship with each other and actually saw that the
 (15) permit value the price in the oiled fishery dropped below
 (16) what the model would predict that price to be?
 (17) A Yes
 (18) Q Let me show you Exhibit 519 The one we just saw was the
 (19) Prince William Sound salmon seine permit model Exhibit 519 -
 (20) let s pull up 519 is the Prince William Sound salmon driftnet
 (21) permit model and is that constructed with a similar approach?
 (22) A Yes it s constructed with the similar approach
 (23) Q And there again the difference this shaded region is
 (24) what you conclude the damage to permit prices are caused by
 (25) the oil spill correct?

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- (1) A Yes What that shaded region represents is at each point
 (2) in time between the spill in 1989 and through the end of the
 (3) data that were available in 1993 the difference between the
 (4) two lines which is the shaded region represents the estimate
 (5) of the loss in value to permits as of that date
 (6) Q Let me show you Exhibit 522 There again I think I ve
 (7) broken this
 (8) 522 This is Cook Inlet salmon driftnet permits correct?
 (9) A Yes
 (10) Q And what I understand you said the next step in the
 (11) analysis which we ll get to is to then take individual
 (12) permits that are sold at a particular point in time and at
 (13) different points in time you can determine the difference the
 (14) damage caused by the oil spill in a permit sale at that point
 (15) in time correct?
 (16) A Yes
 (17) Q Let s look at Exhibit 520 which is Cook Inlet salmon purse
 (18) seine permits Now do all of these models use a similar type
 (19) of analysis comparing the oiled fishery permit to a non-oiled
 (20) fishery permit?
 (21) A Yes The difference in the models there are two different
 (22) possible differences One is whether or not annual data are
 (23) used or in two of these cases quarterly data when quarterly
 (24) data were available when there were enough transactions to be
 (25) able to record prices quarter by quarter The other difference

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- (1) is in the choice of the benchmark or comparison fishery
 (2) So for example in the Prince William Sound salmon purse
 (3) seine fishery the comparison fishery is Southeast purse seine
 (4) salmon purse seine On the other hand Cook Inlet salmon
 (5) driftnet fishery has as its comparison fishery the Bristol Bay
 (6) salmon driftnet fishery
 (7) Q I ve also finally put up Exhibit 524 which is Kodiak
 (8) salmon purse seine fishery Again here have you similarly
 (9) reached the conclusion that the oil spill caused a price effect
 (10) on permits since the date of the spill?
 (11) A Yes And in this case you can see the difference is
 (12) between an amount that s approximately \$125 000 represented
 (13) by
 (14) the blue line and just under \$70 000 represented by the green
 (15) line
 (16) Q We ve seen this exhibit before but let me have Plaintiffs
 (17) Exhibit 3647 pulled up
 (18) In your analysis this was the first step the construction
 (19) of a model Next did you actually look at the permits that
 (20) were sold since the date of the oil spill and make an
 (21) individual determination regarding the damage involved in each
 (22) sale?
 (23) A Yes As this exhibit illustrates this is a recording of
 (24) permit transactions as reported by the Commercial Fisheries
 (25) Entry Commission These are transactions that appeared not to
 be gifts for example between members of the same family

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- (1) For each case the actual reported transaction price was
 (2) compared to the predicted price as of the time of the
 (3) transaction and the difference is the estimate of the loss
 (4) Q Doctor I note that in the transaction transaction listed
 (5) in Plaintiffs Exhibit 3647 they only go - the most recent
 (6) one is in 1993 correct?
 (7) A Yes The available data at the time these data were made
 (8) available included permit transactions only up until some point
 (9) in August The latest transactions we have are in August of
 (10) 1993 Transactions after that are not included in these
 (11) estimates
 (12) Q Let me show you next Plaintiffs Exhibit Number 3645 and
 (13) ask you is this a summation of the conclusions you ve reached
 (14) regarding the damages attributable to the Exxon Valdez oil
 (15) spill in drops in permit values for those that sold since that
 (16) date of the spill?
 (17) A Yes These numbers are summary numbers for each fishery
 (18) listed The number that s associated with the fishery is the
 (19) sum of the loss associated with each permit that s sold where
 (20) that loss is calculated in the way I just described
 (21) Q And just to review one more time plaintiffs exhibit 3647
 (22) which listed all of those individual transactions the only
 (23) damages that you ve included in this chart are those that are
 (24) listed in these sales?
 (25) A Yes

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- (1) Q And so any sales which occurred after the point in 1993
 (2) when you had data you have not included those in your
 damage
 (3) calculations?
 (4) A Correct
 (5) Q And let me just quickly review is the number \$5 321 407
 (6) the damages to those people who sold Prince William Sound
 (7) salmon purse seine permits that you've identified that were
 (8) caused by the Exxon Valdez oil spill?
 (9) A Using this procedure yes
 (10) Q And the same question with regard to Prince William Sound
 (11) salmon drift gillnet that is \$3 612 282 correct?
 (12) A Yes
 (13) Q And Kodiak salmon purse seine the same question is your
 (14) conclusion that the damage was \$2 134 418?
 (15) A Yes
 (16) Q And the same question with regard to Upper Cook Inlet
 (17) salmon drift gillnet the damage of \$8 473 526 that is your
 (18) conclusion as - as to the damage caused by the oil spill?
 (19) A Yes
 (20) Q And just to read these into the record Lower Cook Inlet
 (21) salmon purse seine \$195 000?
 (22) A Yes
 (23) Q And Upper Cook Inlet salmon setnet 3 553 719?
 (24) A Yes
 (25) Q For a total of \$23 290 352?

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- (1) A Yes
 (2) Q Let me ask you since - between September of 1993 when
 you
 (3) last had data from the state on these individual transactions
 (4) and today have there been sales of limited entry permits
 (5) within the oiled regions?
 (6) A In most of the oiled fisheries there have been sales
 (7) although at a reduced rate from what we normally observe
 (8) Q And have you observed a further weakening or a decline in
 (9) the price of those permits?
 (10) A Using the summary numbers that are reported by the
 (11) Commercial Fisheries Entry Commission the answer is yes and
 (12) then also very persuasive to me from discussions with people
 (13) who are involved in the fisheries and in buying and selling
 (14) permits it looks like the drops in these permit values has
 (15) been substantial since the end of the data that I had
 (16) available
 (17) Q Could you explain to us how you would go about calculating
 (18) the loss for a permit that was sold after September 1993 what
 (19) method would you use?
 (20) MR LYNCH Your Honor may we approach Your Honor on
 (21) a relevance question?
 (22) (At side bar off the record)
 (23) MR SARKO Doctor we'll stop with September 93 I
 (24) have no further questions
 (25) THE COURT You may cross examine

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- (1) CROSS EXAMINATION OF JONATHON KARPOFF
 (2) BY MR LYNCH
 (3) Q Dr Karpoff may I approach Your Honor I'm going to loan
 (4) you as I loaned Mr Lohrer my one copy of PX515 for
 (5) identification and my question to you is you are the
 (6) Dr Karpoff who is listed there as a co author of this study?
 (7) A Yes
 (8) Q So this is a study that you authored together with
 (9) Mr Lohrer which you provided to plaintiffs and ultimately led
 (10) to the calculations which you presented here today?
 (11) A Acted primarily as a reviewer of the study
 (12) Q In other words somebody else did the work and you read it
 (13) and said okay I'll go along with it?
 (14) A The people who were involved in calculating the estimates
 (15) and in writing the report consulted with me both before and
 (16) during their conducting of the study
 (17) Q So in other words you had a ghost writer?
 (18) A Yes For some reason they stuck my name on - on the
 (19) report
 (20) Q Well like a lot of these other economic texts you
 (21) probably won't lose your place in literary history either way
 (22) A I think it improves my - the average quality of my
 (23) grading
 (24) Q Let me ask you about that very subject Let me if I may
 (25) show you DX9347 for identification which also has your name
 on

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- (1) the cover this time without Mr Lohrer's involvement You
 (2) recognize that document sir?
 (3) A Yes
 (4) Q Is that a document which you actually wrote?
 (5) A Yes
 (6) Q 9347? Is it DX9347?
 (7) A Yes
 (8) Q And this is a study that you wrote while you were working
 (9) for the Commercial Fisheries Entry Commission?
 (10) A Yes
 (11) Q And the purpose of this study was to conduct an economic
 (12) analysis of limited entry permit prices is that correct sir?
 (13) A Yes
 (14) Q And you concluded I'm referring to Page 2 you concluded
 (15) that not surprisingly price increases for permits correlate
 (16) strongly with increases in the profitability of fishing is
 (17) that correct?
 (18) A Yes
 (19) Q And your study from your study you indicated that what
 (20) was the profitability measure was the net profit what the
 (21) fishermen actually took home take home pay is that correct?
 (22) A Yes
 (23) Q And part of the study was you calculated what those - what
 (24) the costs that the fishermen had to pay out to run his
 (25) operation in determining what - what a fishing permit would

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- (1) support correct?
 (2) A Yes
 (3) Q And do you recall if you look at page 62 I think to
 (4) refresh your recollection your finding at that time was
 (5) that - as I have been told this reads and I have to confess
 (6) that I can't - if you tell me this isn't so I'm going to be
 (7) up here without a net but I'm told that you will tell me that
 (8) it is so that that formula in the middle of the page means that
 (9) the net to the fisherman is about 55 percent less twenty three
 (10) fifty four is that about right?
 (11) A Using data that were available at this time from 1980
 (12) survey that was done by a man named Doug Larsen who was
 (13) working also for the Commercial Fisheries Entry Commission at
 (14) that time I believe I was able to estimate that on average
 (15) there was a relationship as described in this equation between
 (16) the amount of money that people fishing brought in gross
 (17) proceeds and the amount that they were taking home This was
 (18) using survey data from 1980 on things such as the amount of
 (19) ice that the fishermen were using the amount of gasoline they
 (20) were using the cost of their vessels the cost of their help
 (21) and other issues
 (22) Q And is it - did I - was I told true that that equates
 (23) to about a 55 percent plus twenty three fifty one?
 (24) A It means - it's more that the net income is about 45
 (25) percent minus about 23 or 24 hundred dollars

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- (1) Q So the net income is 45 percent of the gross?
 (2) A On average
 (3) Q I understand on average?
 (4) A Using the data that were available in 1980 from the survey
 (5) Q And then you deducted sort of a fixed cost of \$2 351?
 (6) A Yes
 (7) Q Now so that would be one factor that a permit buyer if he
 (8) was at least as well advised as you would look at what his
 (9) net would be cost of operating the vessel paying the share
 (10) that goes to the crew and the pay that goes to the crew ice
 (11) all those things that you mentioned correct?
 (12) A It's not only what I would advise a person considering
 (13) buying a permit to do it looks like - the data indicate that
 (14) that's what in fact people who buy into these fisheries do
 (15) Q They calculate what they're going to make?
 (16) A They make estimates
 (17) Q Okay and you concluded going back to Page 2 that for
 (18) every one dollar of marginal net income you would expect a
 (19) \$1 61 increase in the associated permit price?
 (20) A Using the data that were - that I had available at that
 (21) time for that time period that was the - the best estimate of
 (22) the relationship between those two
 (23) Q You did not use that technique or NRC did not use that
 (24) technique or whoever Mr Lohrer didn't use that technique in
 (25) the approach that you've described today is that correct?

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- (1) A Correct
 (2) Q Now in carrying out that analysis to find out what the
 (3) dollar of marginal net income would be you figure your cost
 (4) You'd also try to estimate what your income would be correct?
 (5) A That would be - figuring the cost would be part of
 (6) figuring out what your expected income would be
 (7) Q I guess it's well established these economic terms income
 (8) to you means -
 (9) A After costs
 (10) Q After costs What would income before costs mean?
 (11) A We could call it revenues
 (12) Q Revenues okay So your revenues as a fisherman would be
 (13) the product of the number of fish you catch times whatever
 (14) somebody's paying for those fish correct?
 (15) A Yes
 (16) Q And in your judgment based on the study you conducted a
 (17) prospective buyer would look at both questions?
 (18) A Yes
 (19) Q So if the state of the world were such that the price of a
 (20) particular kind of fish was falling away competitively and
 (21) didn't show any reasonable prospect of improving you would
 (22) expect permit prices to fall in reaction to falling prices is
 (23) that correct sir?
 (24) A By themselves yes and that's I think a very important
 (25) insight as why the benchmarking analysis that NRC did in

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- (1) looking at permit price changes after the Exxon Valdez oil
 (2) spill is so useful because by comparing oiled permit prices
 (3) with and adjusting - sorry comparing them with the permit
 (4) price changes that happen in non-oiled areas it allows us to
 (5) control for changes in fish price that happen across all
 (6) fisheries
 (7) Q We probably could get out of here sooner if you'll try to
 (8) limit yourself to my question Dr Karpoff
 (9) You're a natural resources economist correct?
 (10) A I have as an area a specialty in natural resources
 (11) particularly fisheries
 (12) Q And does natural resources economics your academic work
 (13) does that include agricultural types of markets?
 (14) A No
 (15) Q In your studies are you acquainted with the - with the
 (16) syndrome for lack of a better term in which the price of
 (17) suppliers of a similar good will benefit from bad - from bad
 (18) fortune to a competitor?
 (19) A Could you give me an example?
 (20) Q Let's say for example there's a freeze in grapefruit in
 (21) Florida When that happens let's see what was that Eddie
 (22) Murphy movie about the grapefruit futures?
 (23) A Orange juice
 (24) Q Orange juice wrong citrus If there's a freeze of
 (25) grapefruit a grapefruit crop in Florida that will tend to

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- (1) help grapefruit farmers in Arizona won't it?
- (2) A I don't know about the data but economic theory predicts that it would
- (3) that it would
- (4) Q Predicts that it would so if I'm - if I'm a Southeast
- (5) pink salmon fisherman all other things being equal and there
- (6) are no runs of pink salmon to Prince William Sound that should
- (7) be to my benefit shouldn't it?
- (8) A To the extent that the - could you tell me why there would
- (9) be a benefit?
- (10) Q Because the supply of pink salmon that would otherwise be
- (11) available in the market will be less won't it?
- (12) A Oh if you think that the supply of salmon that comes from
- (13) say Prince William Sound substantially affects the price that
- (14) will be received by Alaska salmon fishermen in general then
- (15) you could derive such an inference
- (16) Q Well you do -
- (17) A The numbers suggest that that's unlikely
- (18) Q You've heard Dr Crutchfield and Dr Mendelsohn testify
- (19) haven't you?
- (20) A Yes
- (21) Q They would testify you wouldn't look at the price of Alaska
- (22) salmon in general if you're selling pink salmon you heard them
- (23) say that didn't you?
- (24) A I heard them say that especially when they were talking
- (25) about red salmon coming from Cook Inlet

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- (1) Q So you believe that pink salmon - it differs for pink
- (2) salmon? As a fisheries economist you think it differs for
- (3) pink salmon?
- (4) A That what differs the ability of -
- (5) Q If I'm a pink salmon canner and I'm worried about the
- (6) supply of pink salmon because the supply is low or there's no
- (7) fishery in Prince William Sound - I've got fixed costs
- (8) correct?
- (9) A Yes
- (10) Q And I will typically want to can some salmon so that I can
- (11) spread those fixed costs over some profit correct?
- (12) A Yes
- (13) Q And that will tend to create a higher demand or higher
- (14) price for the available supply of pink salmon in a constrained
- (15) market isn't that true sir?
- (16) A I think what you're trying to argue is that -
- (17) Q I'm just asking questions we're not here to argue
- (18) A No I think that the price - when you restrict the supply
- (19) of salmon coming out of Prince William Sound the effect of
- (20) that in and of itself on the price of salmon coming out of
- (21) other areas is going to be very small
- (22) Q But as an economic matter without - you didn't try to
- (23) measure the difference did you?
- (24) A No although you could -
- (25) Q But as an economic matter you would agree that the

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- (1) constraint of the supply in one market generally has a
- (2) beneficial price impact on a complementary supply side market
- (3) correct?
- (4) A That in general if you were to restrict the supply of a
- (5) substantial amount that's other things the same that the
- (6) price of salmon will go up I think that's actually one thing
- (7) that's surprising about the findings that were reported in
- (8) testimony today
- (9) Q One trade of the - one trade of the benchmark markets is
- (10) that they benefit if salmon supplies are reduced in the markets
- (11) you're purporting to measure isn't that true sir?
- (12) A Yes although to be able to make that argument you'd have
- (13) to show or argue convincingly that the salmon that come out of
- (14) Prince William Sound for example are such a large chunk of
- (15) the - of the world salmon supply that it has a big impact on
- (16) prices
- (17) Q Well -
- (18) A I'm not aware of any such evidence
- (19) Q I'm not going to take our limited time to go into that but
- (20) we're not talking about a world market The cannery that buys
- (21) the salmon it has a fixed cost then and there correct?
- (22) A Or on the market that's relevant for the salmon
- (23) Q Let me - may I approach Your Honor?
- (24) Let me hand you a copy of PX3647 I believe this in
- (25) evidence and this I believe is the document that you discussed

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- (1) with Mr Sarko?
- (2) A Yes
- (3) Q And that's the document from which the total numbers that
- (4) you gave us earlier were derived?
- (5) A Yes
- (6) Q When you did your earlier work on fish permit pricing did
- (7) you have actual transaction numbers from the individual
- (8) transaction numbers from CFEC?
- (9) A Do you mean when I did my work in the early 1980s?
- (10) Q Yes sir
- (11) A Yes
- (12) Q And I think I understood you to say with reference to this
- (13) exhibit however that you didn't use the individual
- (14) transaction numbers that are depicted on this exhibit to get
- (15) your benchmark prices for the related fisheries isn't that
- (16) correct sir?
- (17) A Oh to calculate the projected price absent the spill the
- (18) answer is yes
- (19) Q Yes you did not use?
- (20) A Yes I did not use Your statement is correct
- (21) Q What you used were averages?
- (22) A What NRC used were averages provided to them at that time
- (23) by the Commercial Fisheries Entry Commission
- (24) Q What they used were the publicly available averages
- (25) correct?

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- (1) A They got data from the Commercial Fisheries Entry
 (2) Commission and I don't know whether or not the numbers that
 (3) were provided from the commission were identical to those that
 (4) are published publicly by the commission or not
 (5) Q But they were not the individual transaction numbers
 (6) correct?
 (7) A Correct
 (8) Q And so assuming there were enough transactions if - if
 (9) one transaction took place at a very high price and nine
 (10) transactions took place at a low price all NRC would see is
 (11) the average correct?
 (12) A If those - if the average provided to NRC by the
 (13) Commercial Fisheries Entries Commission was computed -
 (14) Q Was an average?
 (15) A - using all such - and they used the arithmetic mean
 (16) yes
 (17) Q They would use the average not the arithmetic mean isn't
 (18) that right?
 (19) A The average - it's interesting you bring that up Average
 (20) can be measured a couple different ways Mean is one term
 (21) that's used where you just take up all the numbers and add
 (22) them up and divide by the number of numbers There are other
 (23) measures of average For example the median which is just
 (24) the midpoint
 (25) Q Do you know then? Do you know?

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- (1) A I don't know how CFEC computed the numbers that it
 provided
 (2) to NRC
 (3) Q Did you ask?
 (4) A No I didn't
 (5) Q So you took - now if I may let's just use a page of this
 (6) for illustrative purposes You took actual transactions listed
 (7) individually in the CFEC records for the areas that you claim
 (8) were damaged correct?
 (9) A Yes
 (10) Q And now you said that you - let me get back to that
 (11) later And that's the - these are the numbers that are in
 (12) this cost column correct sir?
 (13) A Yes the CFEC Commercial Fisheries Entry Commission and
 (14) its data tape called those prices costs
 (15) Q Now when you - well these fields are NRC fields are
 (16) they not sir?
 (17) A No These are provided off of a separate tape that -
 (18) Q I know the data is
 (19) A - was made available to me -
 (20) Q I know they are but the fields here P price that's an
 (21) NRC number only correct?
 (22) A That comes from the projections calculated by NRC but the
 (23) numbers under the column labeled cost come from the
 Commercial
 (24) Fisheries Entry Commission
 (25) Q And you made the assumption that every transaction that

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- (1) would occur over a period of - well 330 472 June of 89 -
 (2) I'm sorry December of 89 to June of 90 correct?
 (3) A Yes
 (4) Q That every one of those transactions should be projected to
 (5) sell at exactly the same price \$330 472?
 (6) A Yes
 (7) Q Although none of those none of the actual transactions
 (8) occurred at the same price is that correct?
 (9) A Yes
 (10) Q Now when you yourself had reviewed CFEC data back in the
 (11) early 80s were you acquainted with the fact that the CFEC
 (12) files customarily and routinely record information about the
 (13) nature of the transaction?
 (14) A Yes
 (15) Q For example whether it's an intrafamily transaction?
 (16) A Yes
 (17) Q For example whether it's a family that involves a
 (18) combination of considerations like a boat and a permit?
 (19) A Yes
 (20) Q Correct? Did you - do you know if NRC or you made any
 (21) effort to determine whether these prices which you have listed
 (22) as the actual prices and as which - and on the basis of
 (23) which - you've asserted people were damaged do you know if
 (24) you made any determination which of those transactions are
 (25) shown by CFEC records to be gifts?

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- (1) A I - my opinion is that NRC did not do any such
 (2) investigation I did however
 (3) Q Okay
 (4) A And -
 (5) Q When did you do that?
 (6) A I did that over the last five weeks
 (7) Q Okay And -
 (8) A And I found out a number of things One thing that I found
 (9) out is that even if you use slightly different estimation
 (10) procedures from those used by NRC you get basically the
 same
 (11) results
 (12) Q Well I think the question was what did you find out about
 (13) whether these are gifts intrafamily transactions trades and
 (14) the like
 (15) A I found out that most of the intrafamily transactions are
 (16) reported at a cost of zero and those transactions are - are
 (17) deleted from the file I guess I have a number of other
 (18) findings but that's an example of one
 (19) Q Now you have some additional findings that you didn't tell
 (20) us in your direct examination?
 (21) A Yes
 (22) Q Let's look at the first transaction - well we can go to
 (23) the side bar about that I don't want to make a public
 (24) spectacle about non disclosure
 (25) Let's look at the first transaction Dr Karpoff That

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- (1) refers to permit 62651?
 (2) A Yes
 (3) Q Correct?
 (4) A Yes
 (5) Q And you show a loss on that transaction of almost \$90 000?
 (6) A Yes
 (7) Q Based on the premise that the permit should have been selling at \$239 376?
 (8) A Yes
 (9) Q Do you know whether the seller of that permit made a profit?
 (10) A No I don't know
 (11) Q Do you know if the CFEC data indicated -
 (12) A The CFEC data for that transaction does not indicate whether or not that seller made a profit
 (13) Q Do you know if the CFEC data that you had at NRC indicates that the seller of that permit acquired it in 1985 for a hundred thousand dollars and made a profit of 50 000?
 (14) A I find it very plausible that that's true Apparently you looked it up
 (15) Q Some of it Let's go to the next transaction You show that transaction at a hundred thousand dollars correct?
 (16) A Yes
 (17) Q And you - you indicate that you think it should have sold at \$330 472 correct?

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- (1) A Yes
 (2) Q Did you determine if a hundred thousand dollars was the only consideration for that transaction?
 (3) A I decided in looking at the data that the - there seemed to be very little correlation between deviations in these cost figures either from those next to them or from the projected permit price and whether or not there were other things sold in conjunction with the permit As a result I decided to ignore that data field and indicating transactions that should be included in this list so I don't know
 (4) Q May I approach Your Honor
 (5) The short answer to my question is you don't know?
 (6) A I don't know if there was anything else sold with this permit
 (7) Q I've handed you DX9346 for identification which is a computer run based on PX3647 the listing that you gave us this morning and all that we've done is to try to put a number there that makes it easier to cross reference these things
 (8) Would it make a difference to you if in addition to getting the hundred thousand dollars the seller of this permit also got a setnet permit?
 (9) A Would it make a difference to me if the cost that the seller reported in this survey was somehow inaccurate is that what you mean?
 (10) Q Yes sir In your judgment as an economist you've - you

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- (1) come here and testified that you believe that some individual
 (2) was damaged to the extent of \$230 472 and you're asking Exxon
 (3) to - to - you're asking this jury to award that \$230 000
 (4) against Exxon correct?
 (5) A Yeah I think the important thing is to note that at the time of this transaction there was a projected price there is also an observed market price That difference is I think the - the best estimate of the loss as of that time for -
 (6) Q What do you mean by an observed market price?
 (7) A The observed market price which can be best estimated using
 (8) available transaction data
 (9) Q So you - by that do you mean that the \$150 000 actual sale that had occurred just a couple months earlier would be a good indication of what the observed market price is?
 (10) A It depends on what other data were available at that time
 (11) Q Okay But let me go back to my original question If the individual who sold this purse - this salmon seine permit can I say that just for simplicity sake also got in addition to the hundred thousand dollars a setnet permit that setnet permit had some value is that correct?
 (12) A Yes And that setnet permit transaction should also be reported with the Commercial Fisheries Entry Commission
 (13) Q And if you look at the Commercial Fisheries Entry Commission records you can find that it was can you not?
 (14) A Yes

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- (1) Q Assuming that the form was -
 (2) A Should be able to
 (3) Q - form was fully and honestly - now I'll represent to you that in this case those records indicated that indeed this seller received a setnet permit in addition to the hundred thousand dollars Do you think that seller was damaged to the extent of \$230 000?
 (4) A Are you telling me that this person filled out that they received a salmon setnet fishery and permit in some other area I take it?
 (5) Q Yes sir
 (6) A And they said they got it at zero cost and they reported that they got this permit at a cost of \$100 000
 (7) Q They said they traded the setnet permit plus boot as they say in the tax field of \$100 000 for their purse seine permit
 (8) A That makes it sound like they - they - oh they paid a hundred thousand dollars plus their setnet permit for the purse seine permit
 (9) Q Correct right Would you think it fair to assess \$230 000 of damages on a transaction in which the seller received \$100 000 plus a setnet permit?
 (10) A If the transaction is exactly as you are presenting to me then I think that the appropriate amount of damage would take into account any other - the value of things that are - that

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- (1) were included in the sale
 (2) Q I think I understood your earlier answer to indicate
 (3) though that you didn't even bother to look at that question?
 (4) A No I didn't. However I think that it's unlikely that we
 (5) would find that type of omission in reporting of the cost to be
 (6) prevalent
 (7) Q Oh okay. So now you're talking prevalence. This is only
 (8) a couple hundred thousand dollars among friends?
 (9) A Well no I think what you're saying is that -
 (10) Q Let me ask you -
 (11) A - that the cost of this - of the - what you're saying is
 (12) that when the CFEC records the cost which we use which I use
 (13) in calculating these numbers that the person who's filling out
 (14) the survey is putting down a number that isn't always
 (15) representative
 (16) Q Well it's represented in the CFEC records as a trade of a
 (17) purse seine permit for a setnet permit plus \$100,000?
 (18) A Uh huh
 (19) Q That's a perfectly legitimate straightforward
 (20) representation to the commission isn't it?
 (21) A So you would like to put down under cost the dollars
 (22) transferred plus the value of the setnet permit?
 (23) Q I would like to - I would just like to find out if you're
 (24) actually saying that in valuing the impact of this transaction
 (25) you shouldn't consider the setnet permit as a part of the

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- (1) value?
 (2) A No I agree with you that you should
 (3) Q Okay Let me ask you if you will look at the document I
 (4) handed you which is -
 (5) THE COURT Mr Lynch I'm getting looks from the
 (6) jury Can we finish quickly or should we go on tomorrow?
 (7) MR LYNCH I think Your Honor considering it's the
 (8) middle of the week that we should go over till tomorrow I've
 (9) got at least a half hour
 (10) THE COURT Ladies and gentlemen we'll adjourn at
 (11) this time Please don't read or look at anything about the
 (12) case during our recess We'll reconvene at 8:00 tomorrow
 (13) morning Be in recess until that time Would counsel stay for
 (14) just a moment please
 (15) Just a moment folks before you go I had a note from the
 (16) foreman asking me when we were going to be off during
 August
 (17) if we go that far If we are not finished by the 11th of
 (18) August we're going to suspend on the 12th which is a Friday
 (19) and we're going to suspend for the following week five days
 (20) We'll recommence then after that Thank you
 (21) (Jury out at 2:06 p.m.)
 (22) THE COURT Mr Murtashaw told me there was something
 (23) we needed to talk about at the end of the day today
 (24) MR O NEILL Yeah we'll - he's our last witness
 (25) We have - in fact we have an offer of proof on the matters

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- (1) that Your Honor excluded like we did for phase one which I've
 (2) marked as Court Exhibit 2 and I'll offer right now pursuant to
 (3) Rule 103 (a)(2) as Court Exhibit 2 and I've discussed it with
 (4) Mr Lynch
 (5) (Exhibit Court 2 offered)
 (6) MR O NEILL And we have one exhibit put in and
 (7) published -
 (8) THE COURT Just a second The Court Exhibit 2 will
 (9) be received It is not admitted into evidence because it will
 (10) not be going to the jury but it is received as part of the
 (11) record for purposes of preserving your record as an offer of
 (12) proof
 (13) (Exhibit Court 2 received)
 (14) MR O NEILL That's correct pursuant to Rule 103
 (15) (a)(2) of the Rules of Evidence
 (16) THE COURT Thank you Next
 (17) MR O NEILL And then we'll be offering by agreement
 (18) a summary exhibit which looks like this which the jury can
 (19) use as a road map It's got each of the items of damage the
 (20) number and the exhibit and then we'll rest
 (21) THE COURT Okay
 (22) MR O NEILL So that's just for planning purposes
 (23) So by 8:30 tomorrow or 8:45 we should - we should rest
 (24) Then the next question I'm the guy who everybody has asked
 (25) to step out in front and see if we can talk you into a four day

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- (1) weekend this weekend
 (2) THE COURT Whoa
 (3) MR O NEILL Neal's hiding behind the Barco
 (4) MR NEAL He's a real coward Judge Real coward
 (5) You talk about being nice I said I asked for the last one
 (6) Brian now will you take the hit on this one Oh sure I'll
 (7) take the hit that's how he takes the hit
 (8) MR O NEILL Well I think he at least - but so I am
 (9) requesting your consideration with regard to a four day
 weekend
 (10) this weekend so that these out of town lawyers can go home I
 (11) myself live in Anchorage
 (12) THE COURT Sure you do
 (13) MR LYNCH Your Honor I might say that we have
 (14) calculated the expected duration of our case and we believe
 (15) that we will be able to finish by next week even with a
 (16) four-day interruption
 (17) THE COURT Okay That causes me to ask you to really
 (18) get with it on your instructions I don't want to get cut
 (19) short like I sort of felt I was last time
 (20) MR SANDERS They haven't done that yet Your Honor
 (21) THE COURT No they haven't done that yet.
 (22) MR O NEILL I think you're going to get them today
 (23) Judge
 (24) THE COURT I take it there's some unanimity of
 (25) feeling that you'd like to have Friday off

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- (1) MR O NEILL Yes sir
 (2) MR LYNCH That s - yes Your Honor
 (3) MR SANDERS That s a way to say it yes
 (4) THE COURT You got it
 (5) MR SANDERS Thank you Your Honor
 (6) MR NEAL Thanks Brian for taking the lumps on
 (7) this
 (8) MR O NEILL Hey you re going home pal
 (9) Thank you Judge
 (10) THE CLERK This court is in recess until eight a m
 (11) tomorrow
 (12) (Recess at 2 10 p m)

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- (1) STATE OF ALASKA)
 - (2) Reporter s Certificate
 - (3) DISTRICT OF ALASKA)
 - (6) I Joy S Brauer a Registered Professional
 - (7) Reporter and Notary Public
 - (8) DO HERBY CERTIFY
 - (9) That the foregoing transcript contains a true and
 - (10) accurate transcription of my shorthand notes of all requested
 - (11) matters held in the foregoing captioned case
 - (12) Further that the transcript was prepared by me
 - (13) or under my direction
 - (14) DATED this day
 - (15) of 1994
 - (21) JOY S BRAUER RPR
 - Notary Public for Alaska
 - (22) My Commission Expires 5 10 97
-

Look-See Concordance Report
UNIQUE WORDS 2,848
TOTAL OCCURRENCES 15,818
NOISE WORDS 385
TOTAL WORDS IN FILE 46,519

SINGLE FILE CONCORDANCE

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CASE SENSITIVE
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Vol 31 5337
 (1) IN THE UNITED STATES DISTRICT COURT
 (2) FOR THE DISTRICT OF ALASKA
 In re:) Case No. A89-0095 CIV (HRH)
 (3)) Anchorage, Alaska
 The EXXON VALDEZ) Tuesday June 28, 1994
 (4)) 8:00 a.m.
 TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY 35th DAY
 BEFORE THE HONORABLE H. RUSSEL HOLLAND JUDGE
 (12) VOLUME 31 Pages 5337 5666
 Realtime Translation

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Vol 31 5339
 (1) PROCEEDINGS
 (2) (Jury in at 8 02 a m)
 (3) (Call to Order of the Court)
 (4) THE COURT Good morning ladies and gentlemen This
 (5) is the continuation of trial in case A89-0095 civil in re the
 (6) Exxon Valdez Mr Lynch you re still up
 (7) Dr Karpoff you understand that you re still under
 (8) oath?
 (9) THE WITNESS Yes
 (10) THE COURT You may proceed Mr Lynch
 (11) MR LYNCH Thank you Your Honor
 (12) CONTINUED CROSS EXAMINATION OF JONATHON
 KARPOFF
 (13) BY MR LYNCH
 (14) Q I sat there in front of you DX2950 for identification
 (15) Would you just take a look at that?
 (16) Your Honor, may I approach the witness?
 (17) Dr Karpoff, do you recognize DX2950 for identification as
 (18) the letter from the State of Alaska Commercial Fisheries Entry
 (19) Commission which was used to establish the benchmark
 (20) calculations that you talked about yesterday?
 (21) A Yes
 (22) Q And I wonder if I could ask you to turn to Page 2, please?
 (23) That s Page 2 of the attachment the table of prices
 (24) Am I correct that NRC used the Southeast purse seine price
 (25) as the benchmark for the Prince William Sound purse seine

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 (1) price?
 (2) A NRC used percentage changes in the Southeast purse seine
 (3) salmon fishery permits as the benchmark
 (4) Q So their assumption was that whatever the percent of change
 (5) up or down that occurred in the Juneau area for purse seine
 (6) fishing permits would be a good indication of what you would
 (7) expect the change up or down to be in Prince William Sound?
 (8) A That the percentage change in the Southeast area would be
 a
 (9) good way to calculate a reliable estimate of the percentage
 (10) changes that would have otherwise occurred in the oiled
 (11) fishery
 (12) Q Okay Now if you look at Southeast percent seine for 1988
 (13) there - see that?
 (14) A Yes
 (15) Q What s the mean shown there?
 (16) A 54 911
 (17) Q And for 1989?
 (18) A 72 300
 (19) Q So the price of the benchmark went up by a percent - went
 (20) up by some number of dollars to begin with correct?
 (21) A Yes
 (22) Q And the percent, I ll represent to you is about 32
 (23) percent, is that correct?
 (24) A That looks - looks about right, yes
 (25) Q Now would you look at Prince William Sound 1988 price?

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- (1) A Yes
 (2) Q What s the price in 1988?
 (3) A 130 659
 (4) Q Okay That s before the spill correct?
 (5) A Yes
 (6) Q What s the price after the spill?
 (7) A The price for 1989 is 228 500
 (8) Q Do you know what that percentage gain is?
 (9) A Looks to be in the neighborhood of 80 percent or so 70
 (10) percent
 (11) Q So it went up about 32 percent in the Southeast the
 (12) benchmark area, and it went up 75 to 80 percent in the Prince
 (13) William Sound area where the spill was correct?
 (14) A Over that - over that period yes
 (15) Q That would indicate, would it not, that people in the spill
 (16) area did better than people in the non-spill area?
 (17) A That expectations of future fishing incomes increased in
 (18) the Prince William Sound area over that period compared to
 (19) similar increase in expectations in Southeast
 (20) Q And if they sold during that period of time they did
 (21) better?
 (22) A If they sold their - if they had bought in at this price
 (23) at 1988 and sold out at the reported price for 1989 they would
 (24) have done better
 (25) Q Okay But NRC nevertheless held that there was a loss

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- (1) during that period of time in Prince William Sound correct?
 (2) A No that isn t correct NRC calculated that when the first
 (3) information about the oil spill hit the permit markets that
 (4) was reflected in a decrease in prices of the affected area
 (5) permits in the second quarter of 1989
 (6) Q Now let me see if I follow this The CFEC data that you
 (7) used to set the benchmark showed a 75 percent to 80 percent
 (8) increase in the value of Prince William Sound purse seine
 (9) permits correct?
 (10) A The - over the 1988 to 1989 period yes
 (11) Q And in the Southeast which you were using as a benchmark
 (12) it only rose 32 percent?
 (13) A From the 88 to 89 period
 (14) Q But it is the fact if we look at PX3647 which you
 (15) discussed with Mr Sarko it is a fact that for every purse
 (16) seine transfer listed on there you claim a price of 330 000
 (17) higher than the - higher than the actual mean shown by the
 (18) CFEC correct?
 (19) A Yes What the procedure used to calculate these projected
 (20) prices did is it focused on the key informational periods when
 (21) news about the permit hit the markets That wasn't in 1988, it
 (22) was in 1989
 (23) Q Right And in 1989 as compared to your benchmark area
 (24) the price in the market where the spill occurred went up actual
 (25) price real world market price, went up 75 to 80 percent

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- (1) correct?
 (2) A From the 1988 to the 1989 period yes
 (3) Q Now -
 (4) A But again the spill happened in 1989 and what the NRC
 (5) estimates do is focus on the impact at the time of the spill
 (6) Q Well impact at the time of the spill is measured by what?
 (7) You have told this jury that you thought that the reasonable
 (8) way to measure what the permit would have done in the
 (9) absence
 (10) of the spill is to look at how permits were doing in a place
 (11) that didn t have a spill correct?
 (12) A Yes
 (13) Q And what the permits were doing in that area was rising 30
 (14) percent correct?
 (15) A If you use the time period that starts -
 (16) Q Before the spill?
 (17) A Long before the spill yes - well several months before
 (18) the spill yes
 (19) Q And goes until after the spill correct?
 (20) A And what the NRC procedure does is it focuses on that
 (21) period just right at the spill
 (22) Q Just right at the spill And it says that even though
 (23) after learning about the spill the price went up by 75 to 80
 (24) percent Even though that happened we ll still find a loss
 (25) correct?
 (26) A Even though prices previously had gone up?

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- (1) Q No The prices in 89 at the end of 89 were up over
 (2) what they were before the spill Isn t that what this document
 (3) shows?
 (4) A The document from - yes from - you re talking about the
 (5) CFEC document?
 (6) Q Yes sir And they continued to rise didn t they into
 (7) 1991?
 (8) A I can t answer that without looking at the numbers again
 (9) Q Let me show you if I may DX2961 for identification You
 (10) recognize Exhibit 2961?
 (11) A It is - it is a - looks like a copy of an excerpt from
 (12) the Fisherman s News
 (13) Q It s actually a series of columns from Fisherman s News
 (14) That s a trade publication You recognize that don t you Dr
 (15) Karpoff?
 (16) A Yes
 (17) Q And the columns are entitled permit news correct?
 (18) A Yes
 (19) Q And that column reports to the trade what people are asking
 (20) for permits in various parts of Alaska and California and
 (21) Oregon and Washington correct?
 (22) A Yes
 (23) Q Do you know who the author of those columns is?
 (24) A At the bottom of this list it says permit news is a
 (25) service of Dock Street Brokers of Seattle

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- (1) Q Do you know who runs Dock Street Brokers?
 (2) A Roger Lohrer
 (3) Q Roger Lohrer your co author on the report that led to your
 (4) damage calculation?
 (5) A Yes
 (6) Q And the man who was here yesterday to testify?
 (7) A Yes
 (8) Q Could you turn to the column for July 1992?
 (9) A Yes
 (10) Q What s the title of that column?
 (11) A Permit prices stabilize as Alaska salmon season kicks off
 (12) Q Would you read the third paragraph of that column?
 (13) A It says Permit prices tended to be more realistic this
 (14) year after several years of inflated values in some areas the
 (15) adjustment in the permit market is the result of short supply
 (16) in some cases and was also caused by large amounts of cash
 (17) flowing into the industry as a result of the Exxon Valdez oil
 (18) spill look for a more stable market in 92 and 93
 (19) Q In your analysis of how permit prices in the spill affected
 (20) areas were doing did you give any consideration to
 (21) Mr Lohrer s observation that permit prices in those areas had
 (22) actually benefitted from the flow of cash resulting from the
 (23) Exxon Valdez oil spill?
 (24) A Actually yes
 (25) Q How did you do that?

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- (1) A The key in going from just the data to I think an
 (2) accurate interpretation of the data is to focus on when
 (3) information about oil spill impacts was hitting the market Aa
 (4) I just said the NRC estimates did that by focusing initially
 (5) on the impact at the time of the spill They used the second
 (6) quarter price change in affected areas NRC then identified a
 (7) second informational period which they identify as starting in
 (8) late 1990 and extending on through the end of their time
 (9) period
 (10) One could quibble with the selection of this informational
 (11) event period For example you could say that NRC should
 (12) have
 (13) focused on the second - as its second informational period as
 (14) beginning in 1991 when first reports started appearing from
 (15) fish study 27, for example, about the projected crash in Cook
 (16) Inlet when initial runs came out of Prince William Sound
 (17) about the strange way that the pink salmon recruit was acting
 (18) in weird and strange ways
 (19) But regardless of your choice of the exact informational
 (20) period when you focus on the informational events, you find
 (21) that when this news was hitting the markets you get
 (22) substantial price decreases in the oiled permits especially
 (23) when compared to non oiled permits
 (24) Q Well the - the truth of the matter is that was a fairly
 (25) long answer to my question which is did you account for the
 inflation which Mr Lohrer observed in the spill areas from the

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- (1) cash flowing into those areas and not to other areas because of
 (2) the clean up activities following the Exxon Valdez oil spill?
 (3) A Yes And I m sorry that I got - that I -
 (4) Q The answer to that question is no, you did not?
 (5) A No that is not the correct answer In looking at the -
 (6) how to identify the correct informational period, I considered
 (7) the fact that there were assurances coming from Exxon soon
 (8) after the spill until sometime in through the 1990 season that
 (9) affected fishermen would be made whole, and that was
 (10) information that was helping to keep permit prices up When
 (11) those assurances appeared to be less credible to affected
 (12) fishermen that was another piece of information that affected
 (13) the permit markets adversely
 (14) Q Well, Dr Karpoff, you can repeat your informational story
 (15) over and over again, but not once have you referred to the
 (16) cash the hard cash flowing into the community which
 (17) Mr Lohrer in his permit news column, said had caused an
 (18) artificial inflation, increase in the value of those shares,
 (19) did you?
 (20) A I did not refer to that, no
 (21) Q And in order to find some way to claim damage during that
 (22) period when prices were rising, you didn't look to your
 (23) benchmark fishery, did you? You didn t look to the Southeast
 (24) percent seine prices did you?
 (25) A I don't understand

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- (1) Q You didn't use the Southeast purse seine fishery in the
 (2) second quarter of 1989 as your benchmark for the period from
 (3) 1989 to 1991 You created a different benchmark didn t you?
 (4) A For fisheries in which there were quarterly data, NRC was
 (5) able to isolate the impact of the oil spill at the second
 (6) quarter of 1989 For fisheries for which they only had annual
 (7) data, they did not They were not able to focus on - on that
 (8) quarter s impact
 (9) Q So in this case even though the Prince William Sound purse
 (10) seine permit rose more than double the benchmark permit you
 (11) looked to another place so you could find a loss, correct?
 (12) A No that isn t correct
 (13) Q Well, you did look to another place?
 (14) A What NRC did was said let s look to an area where we do
 (15) have information available
 (16) Q Was it a different place?
 (17) A And those were the fisheries where they had quarterly data
 (18) Q Was it a different place?
 (19) A And in the -
 (20) THE COURT Gentlemen you re going to have to stop
 (21) talking over one another Dr Karpoff you're not answering
 (22) the question Would you answer his question?
 (23) THE WITNESS I m sorry It was a different fishery
 (24) but it was a fishery where they had data
 (25) BY MR LYNCH

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- (1) Q Dr Karpoff we were looking last night at Plaintiffs
 (2) Exhibit 3647 and we were looking at the second transaction
 and
 (3) that was the transaction in which as I indicated the CFEC
 (4) records indicate that there was a trade of a setnet permit
 (5) Do the CFEC records as kept code transactions to indicate
 (6) whether they are straightforward transactions or whether
 (7) they re gifts or interfamily transactions?
 (8) A Yes
 (9) Q And isn't it the case or do you know have you checked
 (10) before this transaction is coded as a gift?
 (11) A I - I did check that actually and it is not coded as a
 (12) gift
 (13) Q It is not a G transaction?
 (14) A I base that on having double checked a couple of different
 (15) ways these numbers since the beginning of your cross
 (16) examination yesterday
 (17) Q Are you familiar with the CFEC s coding system where
 (18) transactions are coded A G N and O?
 (19) A I take it those are the codes for the type of transaction?
 (20) Q Right Are you familiar with that practice?
 (21) A Yes although I don t know which number or which letter
 (22) refers to which type
 (23) Q G I ll represent to you on the CFEC coding refers to gift
 (24) or interfamily transfer correct?
 (25) A I know that there is a coding for gift and there s a coding

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- (1) for interfamily transfer
 (2) Q Do you know whether the transaction that you show on line
 (3) two of Exhibit 3647 is coded G in the CFEC records?
 (4) A Again since having - checking since yesterday, in my
 (5) checking, the answer is that it is not coded that way
 (6) Q You understand it is not coded G?
 (7) A That is my understanding yes
 (8) Q All right And you personally checked the record?
 (9) A No What I did was I got my research assistant out of bed
 (10) this morning and asked him to rerun my program, checking for
 (11) gift or interfamily transfers I also asked him to check for
 (12) whether or not there were many cases in which other items were
 (13) traded as you indicated there was in this transfer
 (14) Q Did you - do you know what the name of the transfer is
 (15) according to the CFEC records?
 (16) A The records do provide that information
 (17) Q What is his name?
 (18) A I don't know
 (19) Q Russell B Williams, does that sound familiar?
 (20) A I did not record or look at the names
 (21) Q Do you know what the name of the transferee is in this
 (22) transaction?
 (23) A No
 (24) Q Would Gregory T Williams surprise you?
 (25) A No

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- (1) Q Would the fact that Russell Williams is trading to Gregory
 (2) Williams be a tipoff that that might be an interfamily
 (3) transaction?
 (4) A It could be yes
 (5) Q As an economist would you agree that an interfamily
 (6) transaction is not a fair representation of market value?
 (7) A It could be yes
 (8) Q Would you look on Exhibit -
 (9) A May I ask you do you know with whether this is coded as an
 (10) interfamily?
 (11) Q Our information is that it s coded as a G
 (12) Would you look at Exhibit DX9346 which I walked up to you
 (13) a few minutes ago and there s a column on the far left reading
 (14) exhibit line number Would you look at line number 30 on that
 (15) exhibit?
 (16) A On the first page?
 (17) Q Yes sir You see the - this as I told you is a reprint
 (18) of Plaintiffs Exhibit 3647 but this exhibit line number has
 (19) been added to make it easier to cross reference
 (20) A Okay Yes
 (21) Q What permit is covered by exhibit line 30?
 (22) A Line 30 the permit number is 62046 It s a purchase in
 (23) the Prince William Sound salmon purse seine fishery
 (24) Q Okay And what was - what permit was covered by line
 (25) two?

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- (1) A 62046
 (2) Q Is that the same permit?
 (3) A Yes
 (4) Q So the purchase - the purchaser of the permit who - as
 (5) to whom you ve accorded a full measure of damages on line
 two
 (6) correct?
 (7) A Yes
 (8) Q Apparently resold it?
 (9) A Yes
 (10) Q Some months later correct?
 (11) A Yes
 (12) Q And sold it at a price of a hundred thousand dollars?
 (13) A Yes
 (14) Q And again you claim full damages on that second sale?
 (15) A As presented in the exhibit yes
 (16) Q Are you aware that on your exhibit, there are instances
 (17) where permits have been sold three or four times and you claim
 (18) full damages on each sale?
 (19) A No
 (20) Q You re not aware of that?
 (21) A No
 (22) Q Did you check for that?
 (23) A No
 (24) Q If - if a permit is transferred at a lower than what you
 (25) claim to be the proper price the buyer receives an economic

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- (1) benefit doesn't he?
- (2) A The buyer - oh yes By getting a lower than market
- (3) price?
- (4) Q If your Exhibit 3647 is correct economically, correct?
- (5) A Yes
- (6) Q I said correct twice Let me restate the question If the
- (7) numbers on your Exhibit 3647 are correct - let's just take
- (8) this transaction number 2 The buyer of that permit 62046
- (9) received a benefit of approximately \$230,000 by being able to
- (10) buy that permit for less than you think the fair market value
- (11) would have been?
- (12) A No I would not call that a benefit I would say that the
- (13) seller of the permit absent the gift element that you re -
- (14) that you're arguing is there suffered a loss of 230 000
- (15) compared to what otherwise he or she would have gotten
- (16) Q Okay And the buyer certainly didn't invest market value
- (17) did it? According to your calculation of what the market -
- (18) would have been market value, the buyer invested a hundred
- (19) thousand dollars?
- (20) A Invested less than what the permit would have been worth
- (21) absent the spill
- (22) Q But when that buyer goes to resell you charge one hundred
- (23) percent damages for that subsequent sale is that correct?
- (24) A When it is sold again on the exhibit, yes
- (25) Q So under your exhibit this transaction you think had a -

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- (1) resulted in a loss of \$230 000 if a seller resells it every
- (2) three months, then that loss compounds and compounds and
- (3) compounds so that this one permit could end up representing a
- (4) million or two million dollars in your bottom line figure is
- (5) that correct?
- (6) A It's possible the way this exhibit was calculated
- (7) Q Could you look at - let's use the trade number - I think
- (8) trade number seven on your list
- (9) A Yes
- (10) Q Trade number seven is another purse seine permit?
- (11) A Yes
- (12) Q Now if you would that's a - I'll represent to you shown
- (13) in the CFEC data as a C transaction Do you know what a C
- (14) transaction is?
- (15) A No
- (16) Q Combination
- (17) A In that other items were sold with the permit?
- (18) Q Other items were sold with the permit
- (19) A Yes
- (20) Q Okay And according to the CFEC records the other item
- (21) was another permit Would you look at DX9346 and if you
- (22) would at line 147 what does that represent?
- (23) A That represents a transfer in the Prince William Sound
- (24) salmon driftnet fishery
- (25) Q Now as an economist do you think it is proper if the

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- (1) person who sold this Prince William Sound seine permit that
- (2) you
- (3) show in transaction number seven traded his - his seine permit
- (4) for a driftnet permit plus \$150,000, you think it's proper that
- (5) he should claim damages when he later sells the driftnet permit
- (6) for the full amount?
- (7) A Could you repeat that question? I think what you're saying
- (8) is that what was traded in line 137 was traded for what was in
- (9) line seven?
- (10) Q What I'm saying is your seventh trade here the seventh
- (11) permit for which you're claiming damages in this case you're
- (12) claiming damages of \$155 000, correct?
- (13) A Yes
- (14) Q Now, that trade, according to CFEC records, involved the
- (15) transfer of a seine permit for a driftnet permit plus a
- (16) payment a compensating payment of \$150,000, representing
- (17) apparently the higher value of the seine permit correct?
- (18) A As you're representing to me?
- (19) Q Assuming that to be the case
- (20) A Okay
- (21) Q Now if the person who made that trade later sells his
- (22) driftnet permit, you've included that you've claimed damages
- (23) on that sale, too, correct?
- (24) A In each case - now let's take the first case What I
- (25) argue as an economist is that all holders of Prince William
- (26) Sound purse seine fisheries suffered losses in that the value

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- (1) of the permit was less than what it otherwise would be,
- (2) representing that the expectation of the long-term fishing
- (3) incomes were lower - or was lower than it otherwise would be
- (4) So the person that sells the person realizes that loss
- (5) As an economist I maintain that all permit holders will have
- (6) experienced that loss So that's true, too for someone who
- (7) buys into and then subsequently sells out of the driftnet
- (8) fleet
- (9) Q So if a person - according to your analysis your baseline
- (10) analysis assumes that the spill is the damage triggering event
- (11) correct?
- (12) A Yes
- (13) Q All of your damage calculations date from March 24 1989,
- (14) correct?
- (15) A Yes
- (16) Q So if a person buys a permit in late 1989, because there's
- (17) a great pink salmon run - correct?
- (18) A Uh huh
- (19) Q - that person the seller of that permit suffers damage
- (20) correct?
- (21) A The seller of the permit in late 1989, yes
- (22) Q Suffers damage and then if he buys back in, he can suffer
- (23) that damage again?
- (24) A If I can repeat - all holders of permits will have
- (25) suffered the damage The seller realizes it and shows up on

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- (1) this exhibit
 (2) Q This exhibit only deals with actual sales correct?
 (3) A Yes
 (4) Q Now if that – the way you ve done this calculation if a
 (5) permit holder sells he gets damage and you ve calculated
 (6) that correct?
 (7) A Yes
 (8) Q He buys back in and sells a second time he gets more
 (9) damage right?
 (10) A Yes
 (11) Q If he buys back in and sells a third time he gets still
 (12) more damage?
 (13) A Yes And a large part of that is due to the fact that as
 (14) new information kept coming up, particularly in late 1991 and
 (15) continuing through '93 that – the information indicated that
 (16) things were worse than previously thought and permit prices
 (17) were going down
 (18) Q So it s in your view perfectly appropriate to keep
 (19) recharging the same damage dating from 1989 no matter how
 (20) many times? That s a great business isn t it Dr Karpoff?
 (21) A No You would want to avoid double counting You would
 (22) want to make sure to include the damages that accrue from new
 (23) information that was gotten after these –
 (24) Q Only these damages?
 (25) A Yes

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- (1) Q You haven t done that though, have you?
 (2) A No
 (3) Q All of the damage in this calculation dates from March 24
 (4) 1989?
 (5) A No I – no, that's not correct
 (6) MR LYNCH No further questions
 (7) THE COURT Redirect?
 (8) REDIRECT EXAMINATION OF JONATHAN KARPOFF
 (9) BY MR SARKO
 (10) Q Dr Karpoff the fact is the permit prices crashed in all
 (11) of the oiled fisheries when the long term consequences of the
 (12) spill became known is that right?
 (13) A Yes As information accrued we saw price crashes
 (14) Q And your conclusion is that the reason the prices have
 (15) declined so drastically is because of the oil spill correct?
 (16) A Yes
 (17) Q And is that conclusion reinforced by the testimony we heard
 (18) from Roger Lohrer concerning the transactions he was involved
 (19) in since the oil spill?
 (20) A Yes
 (21) Q And is that conclusion reinforced by the testimony of
 (22) Rosaleen Moore that we heard yesterday?
 (23) A Yes
 (24) Q Now Mr Lynch asked you some questions about the prices
 (25) and the way you estimated prices Do I understand correctly

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- (1) that when you sell a permit you report the sales price to the
 (2) State of Alaska?
 (3) A Yes
 (4) Q And the data that you used was the official data for the
 (5) official sales prices that you received from the State of
 (6) Alaska?
 (7) A Yes I used that data in two ways One in the
 (8) preparation of the exhibits about which we ve been talking and
 (9) the second is in my own calculations of the permit damages that
 (10) confirm NRC s findings
 (11) Q And that the calculations we saw in the exhibit were based
 (12) on those official prices?
 (13) A Yes
 (14) MR SARKO No further questions Thank you
 (15) THE COURT Thank you sir You may step down
 (16) MR O'NEILL Your Honor the plaintiffs offer Exhibit
 (17) 60 – Plaintiffs' 6077
 (18) MR LYNCH Your Honor there s no objection There
 (19) may be some need for mathematical corrections but I m sure
 (20) Mr O Neill would want to make them as much as I but the
 (21) document as far as both of us can tell is arithmetically
 (22) correct at the moment
 (23) (Exhibit 6077 offered)
 (24) THE COURT Plaintiffs Exhibit 6077 is admitted
 (25) (Exhibit 6077 received)

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- (1) MR O NEILL May I publish 6077 to the jury Your
 (2) Honor?
 (3) THE COURT Yes you may
 (4) MR O NEILL The columns read across the top item of
 (5) damages damage figure and source and the source column
 as
 (6) you ll see – we ll focus in on a line Take the one at the
 (7) top Kodiak salmon harvest gives you the category Kodiak
 (8) salmon harvest It gives you the damage number off of the
 (9) exhibit and it gives you the exhibit number So this is a
 (10) summary of all of the exhibits that went in that had damage
 (11) numbers on them
 (12) Plaintiffs rest
 (13) THE COURT Thank you sir This completes the
 (14) plaintiffs phase plaintiffs side of Phase II A The
 (15) defendants may call their first witness
 (16) MR SANDERS Your Honor, we re going to get off to a
 (17) rousing start with some readmitted exhibits
 (18) MS ROBINSON Your Honor we have an offer of
 (19) exhibits to which plaintiffs have no objection DX104 DX446
 (20) DX447, DX478, DX601 DX602 DX458 DX444, DX603, DX604,
 DX4831
 (21) DX8639 DX8640, DX8712 DX477 DX1095 DX1441 DX8879
 DX8881
 (22) DX8882 DX8889, DX8890 DX8894 DX8914 DX8919 DX8925
 DX8926
 (23) DX8927 DX8928 DX8929 DX8930 DX8931 DX8932 DX8933
 DX8934
 (24) DX8935 DX8936 DX8937 DX8938 DX8939 DX8940 DX8941
 DX8942
 (25) DX8943 DX8944, DX8945 DX8946 DX8947 DX8948 DX8949
 DX8955

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(25) (The Witness Is Sworn)

- (1) DX8962 DX8963 DX8972 DX8985 DX8986 DX8987 DX1184 DX607
- (2) DX1368 DX1951 DX1952 DX1953 DX1954 DX1955 DX19956 A
- (3) DX1957 A DX1975 DX5006 A DX5007 A DX5324 A DX5583 A
- (4) DX5657 DX5658 B DX5694 DX5708-A DX5714 DX5715 DX5717 A
- (5) DX5718 B DX5719 B DX5720 A DX5722 B DX5723 A DX5727
- (6) DX5730 DX5731 A DX5732 DX8692 DX8693 DX8314 DX8642
- (7) DX8643 DX8644 DX8646 A DX8648 A DX8649 B DX8651 B DX8653
- (8) DX8753 DX8754 DX8760, DX8776 DX8812, DX8886, DX8888, DX8895
- (9) (Exhibits DX104 DX446 DX447 DX478, DX601 DX602 DX458,
- (10) DX444 DX603 DX604 DX4831 DX8639, DX8640, DX8712 DX477
- (11) DX1095 DX1441 DX8879 DX8881 DX8882 DX8889 DX8890 DX8894
- (12) DX8914 DX8919 DX8925 DX8926 DX8927 DX8928 DX8929 DX8930
- (13) DX8931 DX8932 DX8933 DX8934 DX8935 DX8936 DX8937 DX8938
- (14) DX8939 DX8940 DX8941 DX8942 DX8943 DX8944 DX8945 DX8946
- (15) DX8947 DX8948 DX8949 DX8955 DX8962 DX8963 DX8972 DX8985
- (16) DX8986 DX8987 DX1184 DX607 DX1368 DX1951 DX1952, DX1953
- (17) DX1954 DX1955 DX19956 A DX1957 A DX1975 DX5006 A
- (18) DX5007 A DX5324 A DX5583 A DX5657 DX5658 B DX5694
- (19) DX5708 A DX5714 DX5715 DX5717 A DX5718 B DX5719 B
- (20) ~~DX5720 A DX5722 B, DX5723 A, DX5727 DX5730 DX5731 A DX5732~~
- (21) ~~DX8692, DX8693, DX8314, DX8642, DX8643, DX8644~~
- (22) ~~DX8648 A, DX8649 B, DX8651 B, DX8653, DX8753, DX8754~~
- (23) ~~DX444 DX603 DX604 DX4831 DX8639 DX8640 DX8712 DX8750~~
- (24) ~~DX8776 DX8812 DX8886 DX8888 DX8895 offered~~
- (25) ~~DX1095, DX1441, DX8879, DX8881, DX8882, DX8889 DX8890~~
- (26) ~~DX8914 DX8919 DX8925, DX8926 DX8927, DX8928 DX8929 DX8930~~
- (27) ~~DX8931 DX8932 DX8933 DX8934 DX8935 DX8936 DX8937 DX8938~~
- (28) ~~DX8939 DX8940 DX8941 DX8942 DX8943 DX8944 DX8945 DX8946~~
- (29) ~~DX8947 DX8948 DX8949 DX8955 DX8962 DX8963 DX8972 DX8985~~
- (30) ~~DX8986 DX8987 DX1184 DX607 DX1368 DX1951 DX1952 DX1953~~
- (31) ~~DX1954 DX1955, DX19956 A DX1957 A DX1975 DX5006 A~~
- (32) ~~DX5007 A DX5324 A DX5583 A DX5657 DX5658 B DX5694~~
- (33) ~~DX5708 A DX5714 DX5715 DX5717 A DX5718 B DX5719 B~~
- (34) ~~DX5720 A DX5722 B DX5723 A DX5727 DX5730 DX5731 A DX5732~~
- (35) ~~DX8692 DX8693 DX8314 DX8642 DX8643 DX8644 DX8646 A~~
- (36) ~~DX8648 A DX8649 B DX8651 B DX8653 DX8753 DX8754 DX8760~~
- (37) ~~DX8776 DX8812 DX8886 DX8888 DX8895 received)~~
- (38) MR SANDERS May it please the Court I know it s a
- (39) hard act to follow
- (40) MR O NEILL I thought we did a pretty good job of
- (41) boring everybody
- (42) MR SANDERS Defendants call Hans Jahns
- (43) THE CLERK Would you raise your right hand please
- (44) sir?

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- (1) **THE CLERK** Please be seated For the record sir
 (2) state your full name your address and spell your last name
 (3) please
 (4) **THE WITNESS** My name is Hans Otto Friedrich Jahns
 (5) J A-H-N S I live at 8840 Larston Road Houston Texas 77055
 (6) **DIRECT EXAMINATION OF HANS JAHNS**
 (7) **BY MR SANDERS**
 (8) Q Good morning, Doctor
 (9) A Good morning
 (10) Q I m going to ask you if you'll pay particular attention to
 (11) that silver microphone which I think is the better broadcaster
 (12) of the two so that everybody can hear you
 (13) What are you looking for?
 (14) A The set up here
 (15) **THE COURT** Checking out the gear
 (16) **BY MR SANDERS**
 (17) Q Doctor I want to go into your background to some extent in
 (18) a moment but first I want to ask you as of right now you re
 (19) serving as a consultant to Exxon, correct?
 (20) A Yes
 (21) Q And how long have you been in that capacity?
 (22) A Since the first - since early January 1993
 (23) Q And prior to January of 1993 you were an Exxon employee
 (24) an Exxon scientist for a period of 30 years is that correct?
 (25) A Yes

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- (1) Q And you retired in '93 and since then or almost immediately
 (2) thereafter you became a consultant to and for Exxon and
 you ve
 (3) served in that capacity since then?
 (4) A That s correct
 (5) Q So you ve been essentially in one form or another an Exxon
 (6) employee for the last 32 years?
 (7) A That s correct
 (8) Q Were you born and raised in Germany?
 (9) A Yes
 (10) Q And you were born and raised in the pre-World War II years
 (11) is that correct?
 (12) A Yes
 (13) Q I m not going to ask you your age Would you describe for
 (14) the ladies and gentlemen of the jury where you were educated?
 (15) A I went to college - and that s the question, my college
 (16) education?
 (17) Q Yes sir
 (18) A I went to college to a School of Mines in the Harz
 (19) Mountains It s called back all class at that had and I
 (20) studied there geology and mining engineering
 (21) Q We ll spell that for the court reporter later
 (22) A School of Mines The German word
 B E R G A K A D - E M I E
 (23) and the city is Clausthal C L A - U S T - H - A - L It s an old
 (24) mining town
 (25) Q And with your permission, we ll refer to that here and

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- (1) after as the School of Mines?
 (2) A That s good
 (3) Q And did you receive a degree or a diploma or more from the
 (4) School of Mines?
 (5) A Yes I got two diploma degrees one in geology and one in
 (6) mining engineering and -
 (7) Q What years did you get those degrees please?
 (8) A Geology degree was in 1955 The mining engineering
 degree
 (9) was in 1956
 (10) Q All right Now is there an equivalent degree in the
 (11) United States in the same time period or even now for the
 (12) diploma you received in the field of geology?
 (13) A Yes That corresponds to an MS degree in geology
 (14) Q A masters of science degree United States?
 (15) A In geology yes
 (16) Q And is the same true for the diploma you received in
 (17) mining?
 (18) A Yes
 (19) Q All right Now, I think that we all know what geology is
 (20) Let me ask you about the breadth of this mining curriculum In
 (21) your mining curriculum in which you got the equivalent of a
 (22) master of science degree what types of mining did you study?
 (23) A That was a very broad range of mining types included coal
 (24) mining salt mining, iron or mining lead zinc other mining
 (25) and petroleum engineering

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- (1) Q And petroleum engineering, at least in Germany in the
 (2) 1950s was considered mining?
 (3) A Yes it was part of that faculty part of that science
 (4) Q Did you in fact study petroleum engineering as a part of
 (5) your work toward a degree at the School of Mines in Germany in
 (6) 1950 - in the 1950s?
 (7) A Yes
 (8) Q And I take it because it was the equivalent of a master's
 (9) program you did a paper or a thesis in each of those two
 (10) areas, 55 and 56?
 (11) A That s correct
 (12) Q And after receiving those diplomas in 55 and 56 did you
 (13) do graduate work?
 (14) A Yes
 (15) Q Further graduate work?
 (16) A Yes
 (17) Q And in what area did you do this further graduate work?
 (18) A That was specifically in petroleum engineering
 (19) Q And just so we get a glimpse of that without going into
 (20) everything that you did would you describe for the ladies and
 (21) gentlemen of the jury what is - what is studied in the field
 (22) of petroleum engineering in this curriculum at this School of
 (23) Mines?
 (24) A Well it deals with all aspects of the extract - the
 (25) finding and extraction of petroleum exploration exploration

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- (1) drilling production through well bores and also the
 (2) description and calculation of the processes that take place in
 (3) the reservoir By that I mean the accumulation of petroleum in
 (4) the subsurface
 (5) Q Do you study the composition characteristics chemical
 (6) make up of oil?
 (7) A Yes that's part of it
 (8) Q All right And is there a difference depending on what
 (9) kind of crude oil you're talking about in the composition of
 (10) various crude oils?
 (11) A Oh yes there are big differences
 (12) Q Is there a difference in for example the oil in Germany
 (13) and the oil on the Alaskan North Slope in composition
 (14) characteristics chemicals?
 (15) A Well in Germany we have hundreds of oil fields with a wide
 (16) range of properties some were tar like some are very liquid
 (17) There are probably some that are similar to the oil from the
 (18) North Slope
 (19) Yes from field to field you have important differences in
 (20) the flow properties and the chemical make up of the oil that is
 (21) produced
 (22) Q Okay Now I want to come back to this reservoir concept
 (23) in a moment but did you do a doctoral thesis as a part of this
 (24) graduate work at the School of Mines?
 (25) A Yes

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- (1) Q And would you tell the ladies and gentlemen of the jury in
 (2) English what the title of that paper was?
 (3) A The paper dealt with linear and radial displacement of oil
 (4) by water in layered reservoirs
 (5) Q That's a snappy title
 (6) A Sorry
 (7) Q What - what - describe what that was
 (8) A It dealt with the calculational procedure with a method of
 (9) predicting how you could produce oil from a reservoir that is
 (10) not homogenous Most reservoirs are not homogenous This
 (11) was
 (12) a particular case that is frequently found where a reservoir
 (13) consists of several layers of sand or limestone with different
 (14) properties and oil flows all through the layers and the
 (15) interaction of the flow through these different layers was the
 (16) subject of this dissertation
 (17) Q Dr Johns as I understand it then you're dealing with
 (18) how the oil will flow through layers of earth that is different
 (19) make up?
 (20) A Yes
 (21) Q Is that what the thesis was about?
 (22) A Yes
 (23) Q All right Now what is an oil reservoir?
 (24) A It's an accumulation of oil saturated rocks below the
 (25) surface from which you're able to extract the oil
 (26) Q All right And is part of the process of petroleum

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- (1) engineering figuring out how to make oil near the reservoir
 (2) flow into it so that that's where you put the well?
 (3) A That's correct how to make it flow into the well so you
 (4) can produce it
 (5) Q All right Did you stay in this field of petroleum
 (6) engineering after you received your - you did receive a
 (7) doctorate?
 (8) A Yes
 (9) Q When was that?
 (10) A 1961
 (11) Q And that was in petroleum engineering?
 (12) A Yes
 (13) Q Ph D or the equivalent?
 (14) A Doctorate of engineering yes
 (15) Q And after you received this degree did you work in the
 (16) field of petroleum engineering?
 (17) A Yes
 (18) Q Where did you go to work?
 (19) A I worked for an independent oil company in Germany called
 (20) Wintershall
 (21) Q How long did you work for Wintershall?
 (22) A About three and a half years
 (23) Q What work did you do for them?
 (24) A I headed what was called a reservoir lab a laboratory in
 (25) which reservoir studies were conducted

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- (1) Q What specifically did you study? Without getting into a
 (2) great deal of detail what was the basic area in which you
 (3) worked in that laboratory?
 (4) A Well two things Rock properties we would get samples
 (5) from the fields and measure the properties and flow processes
 (6) We would do model tests to simulate or to study the
 (7) displacement of oil in - in these rocks so that we could
 (8) design field methods for extracting the oil most economically
 (9) and most completely
 (10) Q Did you do - in the course of this work you mentioned the
 (11) laboratory work Did you do field work also?
 (12) A Yes I was also employed as a field engineer for a few
 (13) months
 (14) Q Did a lot more laboratory work than field work, right?
 (15) A Yes
 (16) Q Now, did there come a time when you left Wintershall and
 (17) left Germany?
 (18) A Yes
 (19) Q When was that?
 (20) A August of '62
 (21) Q '62 And where did you go?
 (22) A I went to Jersey Production Research in Tulsa Oklahoma
 (23) Q And that is or was a division or affiliate of Exxon or what
 (24) later came to be Exxon?
 (25) A Yes

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- (1) Q And continuously from that time in 1963 in Tulsa Oklahoma
 (2) until the present you ve worked with Exxon for Exxon?
 (3) A 1962 until the end of 1992
 (4) Q All right And when you came to – and just so we can do
 (5) it more quickly and cleanly I ll refer to whatever you were
 (6) working for as Exxon
 (7) A Yes that s fair
 (8) Q Even though we all understand there were different
 (9) subdivisions and affiliates but it s all Exxon?
 (10) A Yes
 (11) Q What was your first job with Exxon? What work did you do
 (12) with Exxon?
 (13) A Well I went to – I did research for Exxon and the first
 (14) assignment was in the area of reservoir description which
 (15) means –
 (16) Q Is that similar to the kind of work that you did for
 (17) Wintershall and that you did all this work in college on?
 (18) A Similar, yes, but more focused on specific research
 (19) questions I mean I came to the U S to do research and here
 (20) really I had the first opportunity to focus and concentrate on
 (21) research problems
 (22) Q Did you get involved in innovations and exploring and
 (23) researching these reservoirs?
 (24) A Yes
 (25) Q And did that take you into the field of computer modeling

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- (1) and that kind of thing?
 (2) A Yes, very much so
 (3) Q Did the focus of your work change thereafter?
 (4) A Yes I ve had many different assignments research
 (5) assignments and worked in different fields for Exxon
 (6) Q Tell me what the next general area – what I'm trying to do
 (7) is explain to the Ladies and Gentlemen of the Jury and the
 (8) Court the different areas in which you have expertise in order
 (9) to tell what you re going to tell later on
 (10) A Yes In about 1966 when I moved over into what we call
 (11) the oceanographic research and there, my – the research
 (12) question that I was working on was to define weight forces for
 (13) which offshore platforms had to be designed
 (14) Q Why was it necessary in the 60s for you or Exxon to worry
 (15) about wave forces on platforms?
 (16) A Well the problem was we were moving into the Gulf of
 (17) Mexico, into deeper water with offshore platforms, and these
 (18) platforms had to be designed for hurricane waves, very high
 (19) waves Not as big as the Gulf of Alaska, but still significant
 (20) wave action and we needed improved techniques to reliably
 (21) design the platforms for what we called the hundred year wave
 (22) Q What did the hundred year wave mean?
 (23) A That would be a wave you would expect on average once in a
 (24) hundred years
 (25) Q I gather that would be a fairly big wave?

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- (1) A Yes
 (2) Q Was it necessary in the course of this work that you did to
 (3) study and understand the properties of waves and the energy
 (4) transmitted in a large wave in a hurricane?
 (5) A Yes That was the purpose
 (6) Q Did you do that?
 (7) A Yes
 (8) Q Did you apply that information that you learned and studied
 (9) in designing these huge oil platforms?
 (10) A That – the method was applied in designing the structures
 (11) typically by other people in my company
 (12) Q How long did you work on that type of project?
 (13) A Full time about two years until 68
 (14) Q All right And did you then move into another area?
 (15) A Yes
 (16) Q What area was that?
 (17) A In 68 that was the year of the discovery of Prudhoe Bay
 (18) and I moved into an area in which I stayed for a long time
 (19) which we called arctic engineering
 (20) Q Can you tell the Ladies and Gentlemen of the Jury in a
 (21) general way what kinds of arctic engineering you actually did?
 (22) A Well much of the work was focused on Alaska It started
 (23) with the discovery of Prudhoe Bay and there were essentially
 (24) two problems that the industry had not faced before one
 (25) dealing on shore with permafrost ice ridge around, and the

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- (1) second dealing offshore with sea ice forces
 (2) Q And did that – the second one did that once again get you
 (3) into the area of understanding waves and action of the sea
 (4) against platforms?
 (5) A Yes And in this case it was gravel islands The
 (6) offshore activity in the North Slope specifically involved the
 (7) construction of gravel islands and they had to be designed not
 (8) only against ice flows but also against wave forces There
 (9) was a lot of coastal engineering shoreline protection work
 (10) involved in the designing of these platforms
 (11) Q Just very briefly what was the permafrost problem and how
 (12) did it get solved? Were you a part of that?
 (13) A Yes Well the permafrost problem was one around the
 (14) structures we built or the well bores or the pipeline If
 (15) permafrost were to thaw you would lose your foundation, which
 (16) is a common problem in Alaska It's related to the frost
 (17) heaves problems, permafrost subsidence and we worked on
 (18) that
 (19) in properly designing the well bores and properly designing the
 (20) pipeline so that problem would be overcome
 (21) Q And in part, was that problem overcome by elevating the
 (22) pipeline?
 (23) A Yes but that was not enough You had to also make sure
 (24) that the ground around the pipeline supports would stay
 (25) frozen
 (26) Q In the field of arctic engineering, we want to focus more

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- (1) on the protection of the shoreline the understanding of the
 (2) forces on these rocks gravels that would form the foundation
 (3) for these You obviously applied your previously acquired
 (4) expertise in understanding wave forces
 (5) Did you also have to understand currents?
 (6) A Yes The currents of course played a role in platform
 (7) design, just as well as waves
 (8) Q Did you also have to understand the geology of the beach or
 (9) the shoreline or the gravel island you were making as it
 (10) related to the currents and the waves and Mother Nature?
 (11) A Yes That is an important aspect of what I call the coastal
 (12) engineering determine the size of rocks that can be moved by a
 (13) wave for instance so that you could design bigger rocks to
 (14) protect the shoreline
 (15) Q All right Now in the course of these things that you
 (16) did up to this point in time - and let's get us an end point
 (17) here This project lasted quite a bit of your life, didn't it?
 (18) A Until '86
 (19) Q And from '86 backwards, did you publish various papers in
 (20) the various fields in which you've described to the jury that
 (21) you have worked?
 (22) A Yes
 (23) Q And were these papers submitted to scientific publications?
 (24) A Yes
 (25) Q And were these papers peer reviewed by the scientific

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- (1) society?
 (2) A Most of them, yes
 (3) Q Would you give us a brief snapshot if you would of
 (4) papers - of the types of papers you wrote in these different
 (5) areas that you've described to the jury?
 (6) A In reservoir engineering, I published papers on what we
 (7) called inverse simulation, a technique to deduce reservoir
 (8) properties from measurements you can make on the surface
 (9) a computer technique
 (10) In wave force probabilities I published a paper on that
 (11) topic probabilities of wave forces for instance this problem
 (12) of how do you select a hundred year wave wave force
 (13) And in the area of arctic engineering I published numerous
 (14) papers on the technology that was being developed for
 (15) instance for permafrost protection for the pipeline and also
 (16) for offshore technology for offshore exploration and
 (17) production
 (18) Q All right Now from '86 forward - and maybe I should
 (19) recapture a little time before that but in the hierarchy of
 (20) Exxon research - which is where you always stayed, correct?
 (21) A Yes
 (22) Q And you worked I think for Exxon Production Research?
 (23) A Yes
 (24) Q And that's one of a number of research facilities that
 (25) operate under the Exxon umbrella correct?

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- (1) A Yes
 (2) Q Did you kind of percolate up through the hierarchy of
 (3) the - of that particular research organization?
 (4) A Yes
 (5) Q By '86 what was your - what was your position?
 (6) A I had the title of senior research scientist which was the
 (7) highest technical position within Exxon
 (8) Q And as such, did your work broaden out some?
 (9) A Oh, yes
 (10) Q And did it broaden out to cover all of the areas that the
 (11) Exxon Production Research handled in those years from '86
 (12) forward?
 (13) A Many of those areas Perhaps most of them, yes
 (14) Q And did you get in a position where you were reviewing
 (15) proposals from other disciplines and using that information to
 (16) make decisions?
 (17) A Yes
 (18) Q By the way, I meant to ask you, when you would publish in a
 (19) scientific journal these types of papers that you talked about,
 (20) was there a company or corporate policy which required that
 (21) those papers first be reviewed by Exxon Corporation?
 (22) A Yes, that was customary
 (23) Q And to your knowledge is that customary for all
 (24) corporations?
 (25) A Yes

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- (1) Q Corporate employees going to publish something in a
 (2) scientific journal, the corporation gets to look at it first?
 (3) A Yes
 (4) Q Now this may be a little out of order but I think we
 (5) ought to go into this first In - I do this my own way
 (6) sometime
 (7) Dr Jahns did there come a time when you came to Alaska in
 (8) the late '80s as a result of this oil spill?
 (9) A Yes
 (10) Q And when did you come to Alaska?
 (11) A Well, my first trip to Alaska was in May in connection with
 (12) the oil spill I'd been in Alaska many times before, of
 (13) course In May '89 my first trip to Prince William Sound
 (14) Q And did you have a job in connection with the clean up of
 (15) the oil spill?
 (16) A Yes
 (17) Q What was your job?
 (18) A I was a member of a - of a task force which was
 (19) established to develop improved technology for cleaning up
 (20) this
 (21) mess that we had made here
 (22) Q All right Now, when you talk about the improved
 (23) technology here you're talking about the beach clean up
 (24) operation or some other type of clean up operation?
 (25) A The task force really dealt with the best way to cleanup
 the beaches because that was perceived as the biggest
 problem

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- (1) Q And certainly as of April and May of 1989?
- (2) A Yes sir
- (3) Q And were there other people in the task force on which you served?
- (4) A Oh yes
- (5) Q In which you served?
- (6) A Yes
- (7) Q Were they people - they were Exxon people?
- (8) A Yes The task force was composed of scientists from the various research organizations and operating organizations and laboratories that Exxon has worldwide really
- (9) Q Dr Jahns let me ask you when you came to Alaska to serve on this task force which was designed to try to come up with improved technologies for cleaning up this mess, did you know everything you needed to know about cleaning up an oil spill of this magnitude and this kind of environment?
- (10) A No I don't think anybody did This was unprecedented
- (11) Q From the time of the - that you came and started working on this project did you work on this project continuously for the next period of time?
- (12) A Pretty much so yes I still had a job on the side but I was focusing all my time on the task force
- (13) Q And as a result of being on that task force did you stay either in Alaska or in the laboratory in connection with these - these clean-up issues through the summer of 1989?

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- (1) A Yes
- (2) Q Through the winter 89/ 90?
- (3) A In the winter I transferred to Alaska and stayed here full time
- (4) Q And thereafter, did you stay with either physically or mentally with the cleanup and study of the Sound through those years?
- (5) A Yes
- (6) MR SANDERS May it please the Court I respectfully offer Dr Jahns as an expert in geology petroleum engineering the specific area of oceanography that we have discussed in his testimony and in arctic engineering
- (7) MR JAMIN No objection
- (8) THE COURT Thank you Dr Jahns qualifications are accepted by the Court
- (9) MR SANDERS Thank you, Your Honor
- (10) BY MR SANDERS
- (11) Q Dr Jahns, I left out one thing that I want to get to before I get to the main purpose you're here In the course of your work as a petroleum engineer, and you can tell us how far back this would apply, throughout have you performed what is called a mass balance?
- (12) A Yes
- (13) Q All right First tell us what a mass balance is and then tell us how long you have been dealing with that kind of

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- (1) concept
- (2) A Well mass balances are really the bread and butter I would call it of reservoir engineering which has been my original field of study It involves an accounting of all the inflows and outflows of oil water and other substances in a reservoir if you're talking about the mass balance of a reservoir It's a concept with which reservoir engineers petroleum engineers are very familiar
- (3) Q And I take it then that this is the kind of task if I can call it that that you've been engaged in ever since you started studying petroleum engineering?
- (4) A Yes
- (5) Q Dr Jahns I asked you to come here today in order to talk to the jury about what happened to the oil that was spilled and I would like to start if you would with a description of the composition of the particular oil that was spilled
- (6) And would you first confirm what everybody already knows what kind of oil was this?
- (7) A It was oil that was derived from the North Slope of Alaska loaded in Valdez into the tanker
- (8) Q And is it known at least colloquially as Alaskan North Slope crude oil?
- (9) A Yes
- (10) Q I have brought up what is marked for identification as Defendants Exhibit 5266

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- (1) Excuse me Is there an A on that?
- (2) 5266 A Would you explain to the jury - that's an exhibit you had prepared, right?
- (3) A Yes
- (4) Q And would you explain to the jury what this depicts and explain to the jury what the properties are and characteristics of Alaskan North Slope crude?
- (5) A Well I want to first say that before I get into this that oil is a mixture of many many compounds ten thousands of different compounds and they're all mixed up So if you put a barrel of oil put oil into a barrel you have all these compounds mixed up which is not what this picture shows This picture shows the result of what you would get if you could sort and order all the molecules according to their size Each compound is a different molecular structure
- (6) Q All right So you have for purposes of explanation or illustration you've taken the compounds and drawn a line so that there are three major groups?
- (7) A Yes Once you've done this assortment, you can easily - and it's the best for our discussion to divide this barrel of oil into three categories The top one is the light ends these are the volatile hydrocarbons the ones that evaporate most easily that you have in gasoline or liquefied petroleum gas
- (8) The bottom one let me do that next That's the inert

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- (1) stuff the refractory as it's called. You can't oil it off.
- (2) It's like tar or asphalt. And then the large portion in the
- (3) middle or the middle distillates the medium heavy oil is used
- (4) for making diesel oil, fuel oil, lube oil, et cetera.
- (5) Q Doctor, I'm going to ask you when you rear back there to
- (6) look at the screen, I want you to talk louder because you're
- (7) farther away from that microphone.
- (8) A Yes.
- (9) Q You have drawn the opposite the corresponding part of this
- (10) barrel, a picture of what these compounds look like, correct?
- (11) A A few of them are shown there for illustration.
- (12) Q That's one of my points. You haven't drawn them all in
- (13) there, that's a representative sample of that kind of compound
- (14) that's found in this light end?
- (15) A Yes.
- (16) Q And then for the second - the second or the middle portion
- (17) of the barrel, you've drawn these compounds to show how
- (18) different they are?
- (19) A Yes.
- (20) Q Or show the difference between them, correct?
- (21) A You want me to talk about these compounds a little bit?
- (22) Q Yeah, I do. I want to first point out though that you've
- (23) drawn different descriptions of these molecules, correct?
- (24) A Yes.
- (25) Q Now I do want you to describe what the difference is, and

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- (1) we're going to get to the significance of this difference in
- (2) just a moment, but tell the Ladies and Gentlemen of the Jury
- (3) and the Court what the difference is between these three major
- (4) groups.
- (5) A Well, it's mainly in the size of the molecules. You see
- (6) little bitty molecules up there, little chains and little rings
- (7) that make up the volatile portion. You see -
- (8) Q All right. Now let's stop a minute. Volatile, what is
- (9) volatile? Why is that significant for us?
- (10) A That's significant because the volatile portion will
- (11) evaporate easily.
- (12) Q Okay, that answers that. Now, what about the next area?
- (13) A These - the middle portion is composed of larger
- (14) molecules. We call these chains. Sometimes the chains are
- (15) doubled back on itself and you get rings, and they're saturated
- (16) rings like the one on the left here, and then there are others
- (17) that are called unsaturated aromatic (ph) ring compounds
- (18) which we call polycyclic aromatic hydrocarbons, or PAHs.
- (19) Q PAHs are toxic, are they not?
- (20) A That's what's listed here as toxic, one to two percent of
- (21) the oil.
- (22) Q Can you say where most of the toxic hydrocarbons are in a
- (23) typical barrel of Alaskan North Slope crude?
- (24) A Initially up here. It's these aromatic single ring
- (25) compounds, benzene.

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- (1) Q And when you say an aromatic compound, is that something
- (2) you can smell?
- (3) A Yes. That's why they're called aromatic.
- (4) Q When the spill occurred and there was this awful smell down
- (5) there, what was that?
- (6) A Those were the aromatics evaporating.
- (7) Q Now, the molecules in this second group, in the middle of
- (8) the barrel, I take it they don't evaporate?
- (9) A That's right, only very slowly.
- (10) Q Okay. Now let's go down and talk a little bit about the
- (11) bottom of the barrel?
- (12) A The bottom of the barrel, which we'll call the asphaltenes
- (13) and resins, really, is composed of very complicated, very large
- (14) molecules. We would call this chicken wire in the jargon, and
- (15) they are inert in many senses. You can burn them, but you
- (16) can't evaporate them, you cannot boil them off, and it's -
- (17) that's the substances that are in the roof tar or asphalt that
- (18) are put on the road.
- (19) Q What, the biologically inert and why is that significant for
- (20) us?
- (21) A Biologically inert means it neither affects nor can be
- (22) decomposed by biological organisms.
- (23) Q Now, of course with the barrel spills in the water, it
- (24) doesn't subdivide into these three sections, does it?
- (25) A That's right. That's the point I wanted to make earlier.

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- (1) Q Okay. And what is to become this bottom part of the
- (2) barrel, which is biologically inert, in some cases takes quite
- (3) a bit of time, does it not?
- (4) A Yes.
- (5) Q And let's stay with that just a moment. Of the - you've
- (6) got percentages out here in the far right hand corner?
- (7) A Yes.
- (8) Q And tell the Ladies and Gentlemen of the Jury what these
- (9) percentages represent first and then we'll discuss some of
- (10) them.
- (11) A Yeah. They're percentages of the total whole fresh oil.
- (12) So this means that 20 to 30 percent of the oil are in this
- (13) volatile fraction, 20 to 30 percent will evaporate. How much
- (14) depends on conditions, and we'll talk about that, 18 to 20
- (15) percent is this inert portion, the asphaltenes, and asphaltic
- (16) residue, as we call it, and the rest in this case, 50 to 60
- (17) percent is the middle portion.
- (18) Q All right. Now, eventually, did - from the oil that was
- (19) spilled in Prince William Sound, did 20 to 30 percent of it
- (20) ultimately evaporate? We're going to put a - maybe a tighter
- (21) number on that in a minute, but is that basically the
- (22) significance of this?
- (23) A Yes.
- (24) Q And did 18 to 20 percent of it find its way to someplace in
- (25) a biologically inert condition?

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- (1) A Yes with some qualification Some of it was picked up -
 (2) Q Right
 (3) A - in the cleanup
 (4) Q Some of it was picked up in the cleanup but that which was
 (5) not picked up that ended up somewhere in a biologically inert
 (6) condition correct?
 (7) A Yes
 (8) Q All right Now is biologically inert is that - is that
 (9) a danger to plant and animal life?
 (10) A No As the term implies it is not
 (11) Q I just wanted to make sure that was clear
 (12) A Right
 (13) Q Now let's talk about that just a minute It is
 (14) nevertheless here with us is it not?
 (15) A Yes
 (16) Q That 18 to 20 percent or roughly what it was it is with
 (17) us?
 (18) A Yes
 (19) Q You're saying it is not - it is biologically inert?
 (20) A Yes
 (21) Q And when it is - when it sifts out and becomes this
 (22) biologically inert thing is it - is it a tar mat?
 (23) A No And that's where the analogy to the asphalt road
 (24) breaks down It is not a tar mat It is finely dispersed in the
 (25) environment

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- (1) Q And I take it most of this goes in the bottom of some sea?
 (2) A Yes, eventually
 (3) Q And if you were a diver and you had the right equipment and
 (4) you went down and you swam along would you be able to see
 (5) it?
 (6) A No
 (7) Q Could you separate it from the other stuff that was at the
 (8) bottom?
 (9) A No
 (10) Q How do you do that?
 (11) A Either with a microscope or chemically
 (12) Q Have studies been made of what is at the bottom of Prince
 (13) William Sound in terms of biologically inert by products of
 (14) oil?
 (15) A Yes
 (16) Q Is it possible to tell scientifically what part of that
 (17) which was found at the bottom is attributable or is from the
 (18) Exxon Valdez?
 (19) A Yes You use a technique that is called fingerprinting to
 (20) do that
 (21) Q All right Let me get to the other side before we talk
 (22) about fingerprinting Is it possible to tell that the other
 (23) part of it is from some other source?
 (24) A Yes
 (25) Q Do scientists think they know what the majority of this
 other source is?

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- (1) A Yes
 (2) Q What is it?
 (3) A It is oil derived or it is hydrocarbons petroleum
 (4) hydrocarbons derived from natural seeps
 (5) Q And are natural seeps - do they occur in or near Alaska?
 (6) A They occur all along the coast of the Gulf of Alaska
 (7) Q And some of these are well known are they not?
 (8) A Oh yes
 (9) Q One of which is the Katalla Sea?
 (10) A Yes
 (11) Q And where is that or where are they?
 (12) A That is to the southeast of Prince William Sound beyond the
 (13) Copper River Delta
 (14) Q And are these seeps on the land?
 (15) A They're probably both You find most of the ones on the
 (16) land and there are some reports and certainly a very high
 (17) probability, that some of them are offshore as well
 (18) Q Was the Katalla area a place where at least they tried to
 (19) drill for oil or there was an oil drilling outfit at some
 (20) point?
 (21) A Yes there was an oil field there
 (22) Q When?
 (23) A In the 20s I believe These seeps are the first sign
 (24) that an explorationist looks for to try to find oil
 (25) Q Now do this - do this - moving right along Does the

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- (1) oil from the these seeps find its way into Prince William
 (2) Sound?
 (3) A Some of the hydrocarbons do yes
 (4) Q How is that?
 (5) A Well these hydrocarbons I mentioned that the Katalla
 (6) seeps are beyond the Copper River Delta and they drift along
 (7) the shoreline to the northeast through the waters that come out
 (8) of the Copper River Delta, which are heavily laden with
 (9) sediments and petroleum hydrocarbons particularly PAHs that
 (10) are here tend to be absorbed onto clays And as some of these
 (11) clay - suspended clay particles and other mineral particles
 (12) drift into Prince William Sound the hydrocarbons will go with
 (13) them and be sedimented out in Prince William Sound That is
 (14) how they get there
 (15) Q In other words the current from the Gulf of Alaska which
 (16) goes into Prince William Sound, brings this in?
 (17) A Yes
 (18) Q And then it's - some of it is deposited on the floor?
 (19) A Right
 (20) Q Now relating to your point about biologically inert how
 (21) long has this oil by-product these hydrocarbons been coming
 (22) into Prince William Sound?
 (23) A Well for hundreds of years probably since the last ice
 (24) age
 (25) Q And -

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- (1) A Which would be thousands of years
 (2) Q Using this fingerprinting process which we'll talk about a
 (3) little bit can one compare the amount of hydrocarbons existing
 (4) as biologically inert matter in Prince William - the floor of
 (5) Prince William Sound can one compare that from these seeps
 and
 (6) perhaps other sources with the amount that is there from the
 (7) Exxon Valdez?
 (8) A Yes
 (9) Q And is - which one - which one is most, more?
 (10) A Oh by far the - the highest portion of petroleum
 (11) hydrocarbons particularly the ones with the fingerprint are
 (12) from natural sources in Prince William Sound because it's been
 (13) going on for a long time That's the reason
 (14) Q Have these measurements been made?
 (15) A Yes I'm familiar with such measurements
 (16) Q You are?
 (17) A Yes
 (18) Q And are you familiar with the samples that were taken?
 (19) A Yes
 (20) Q And the comparisons that were made?
 (21) A Yes
 (22) Q I show you what's been marked as Defendants Exhibit - I
 (23) apologize I can't read the size of this I have to get
 (24) another source
 (25) MR JAMIN It's 4954 counsel

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- (1) MR SANDERS Thank you Mr Jamn
 (2) BY MR SANDERS
 (3) Q 4954 is this a representation of that study and that
 (4) analysis?
 (5) A Yes It was some of the results from that analysis
 (6) Q You're familiar with those?
 (7) A Yes
 (8) Q And quite clearly the amount of this sediment
 (9) attributable or which came from the Exxon Valdez oil spill is
 (10) in red on the charts?
 (11) A Yes
 (12) Q And that which is from the seeps and other sources is
 (13) called background?
 (14) A Correct
 (15) Q And colored green?
 (16) A Yes sir
 (17) Q And I take it that there were measurements made at
 (18) different locations within the Sound?
 (19) A That's correct
 (20) Q And nearshore is - well, the chart says less than a
 (21) hundred meters from the shoreline?
 (22) A Yes Specifically it's less than a hundred meters from
 (23) oiled shorelines from shorelines that were oiled by the Exxon
 (24) Valdez
 (25) Q And the embayment part where is that?

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- (1) A That's - embankments that were heavily oiled includes Bay
 (2) of Isles Northwest Bay and I believe Herring Bay
 (3) Q And then offshore refers to what areas?
 (4) A Areas in the spill path but more than - more than a
 (5) hundred meters from shore
 (6) Q Less than a kilometer?
 (7) A Yes
 (8) Q Then there's the deep subtidal?
 (9) A Deep subtidal, that's correct More than one kilometer
 (10) from shore, and some of that is not in the spill path
 (11) Q All right Now, I put this off long enough Would you
 (12) explain to the Ladies and Gentlemen of the Jury how one
 (13) fingerprints oil?
 (14) A The compounds that are best suited for fingerprinting are
 (15) the PAHs which I mentioned before the polycyclic aromatic
 (16) hydrocarbons I need to explain they are not only the two and
 (17) three ring compounds that we have in the middle class, but also
 (18) higher compounds which have four and five and six rings They
 (19) get to be real complicated structures All of those are used
 (20) for fingerprinting, and what - does that answer the question?
 (21) Q I beg your pardon?
 (22) A I've explained the compounds that were used for
 (23) fingerprinting Do you want me to go on and explain the
 (24) chart?
 (25) Q Please

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- (1) A The chart shows concentrations, average concentrations,
 (2) that were found in a number of samples taken at these various
 (3) locations The concentration is plotted in parts per billion
 (4) Now part per billion is a very small concentration If you
 (5) put a drop of oil or milk in a swimming pool, a large swimming
 (6) pool you have about a part per billion It's a very small
 (7) concentration
 (8) In these sediments in the deep subtidal, you find as many
 (9) as 700 parts per billion of these PAHs which are all not
 (10) derived from the spill The fingerprint shows that they do not
 (11) come from the spill but that they're part of the natural
 (12) background
 (13) In the nearshore where sedimentation is more rapid the
 (14) overall concentration is lower and we found maybe a third on
 (15) average, near these oiled shorelines coming from the Exxon
 (16) Valdez spill but two thirds still being derived from the near
 (17) backgrounds
 (18) Q Dr Jahns when were these samples taken the sediment
 (19) samples?
 (20) A This was taken in the summers of 1990 and 91
 (21) Q And when was the analysis and fingerprinting of that done?
 (22) A Subsequent - shortly thereafter
 (23) Q Now this fingerprinting is that - is that an Exxon
 (24) innovation?
 (25) A Well we've improved it but the technique and the concept

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- (1) are not new Fingerprinting is used to identify oils and other
 (2) substances
 (3) Q Matter of fact it s used by the government in prosecuting
 (4) pollution cases to be able to say this was your pollution as
 (5) opposed to somebody else s pollution correct?
 (6) A Yes Yes
 (7) MR SANDERS Your Honor I move the admission of the
 (8) exhibit and it's 4954 Is that the number?
 (9) (Exhibit 4954 offered)
 (10) MR JAMIN That s the number and that s fine
 (11) THE COURT Thank you Defendants Exhibit 4954 is
 (12) admitted
 (13) (Exhibit 4954 received)
 (14) THE COURT Did you wish to offer that earlier exhibit
 (15) also?
 (16) MR SANDERS I do eventually, and now s a good time
 (17) (Exhibit 5266 A offered)
 (18) THE COURT Is there objection to Defendants Exhibit
 (19) 5266-A?
 (20) MR JAMIN There is none
 (21) THE COURT 5266 A is admitted
 (22) (Exhibit 5266-A received)
 (23) BY MR SANDERS
 (24) Q I want to bring that up just a second Now I want - I
 (25) want the Ladies and Gentlemen of the Jury to see this one more

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- (1) time before we move to the next part of what happened to the
 (2) oil It is - it is clear and I want to make it clear that
 (3) within this middle portion of the barrel there are toxic
 (4) substances correct?
 (5) A Yes
 (6) Q And those toxic substances existed in this section of the
 (7) barrel?
 (8) A The middle portion yes
 (9) Q When the oil was in the water?
 (10) A Yes
 (11) Q This part didn t evaporate?
 (12) A No
 (13) Q And it is in to some extent maybe a lesser extent, when
 (14) the oil went on the beach?
 (15) A Yes
 (16) Q The various places and against the rocks?
 (17) A Yes
 (18) Q All right That s clear, then You estimate or is it an
 (19) estimate or is this precise how much of the - of the toxics
 (20) in the oil make up this middle section? What percentage of the
 (21) middle section is toxic?
 (22) A Well, this says one to two percent I think the most
 (23) accurate number is 1.4 percent for the PAHs, two and three ring
 (24) PAHs that are considered toxic
 (25) Q And in this top part, the light end, what percentage of

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- (1) that light end is toxic?
 (2) A Again we re talking about percentages of the whole oil
 (3) these benzene rings as they re called and other
 monoaromatics
 (4) are the toxic portions of the volatiles That s on the order
 (5) of one percent or a little less than one percent
 (6) Q Okay So of the toxic substances in a representative
 (7) barrel of Alaskan North Slope crude oil roughly half is in the
 (8) light end which evaporates?
 (9) A Yes and it s the more toxic half
 (10) Q I was going to ask you that Most of the toxic - the more
 (11) toxic of these molecules is in the light end and that s what
 (12) goes in the air?
 (13) A Yes
 (14) Q All right Now when it goes into the air what happens to
 (15) it?
 (16) A It disperses gets fully oxidized, gets broken down
 (17) Q All right Now I want to discuss with you more
 (18) particularly having understood the composition of this oil and
 (19) what happens to it where did it go Now I d like to start
 (20) with that part which was in the water and didn t come in
 (21) contact with the ground Okay?
 (22) A Yes
 (23) Q And to do that I d like to use three or four exhibits that
 (24) are pictures taken from what these jurors have already seen
 (25) from the plaintiffs exhibit as the NOAA HAZMAT hindcast Let

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- (1) me bring up the first one
 (2) This is I think, preadmitted Defendants Exhibit 601
 (3) What does that represent?
 (4) A Well it shows the situation one day after the spill event
 (5) at noon on March 25 and shows a good estimate of the extent of
 (6) the spill at that time
 (7) Q All right Now have you reviewed the entire videotape
 (8) that was prepared?
 (9) A Yes I m very familiar with it I have a copy myself
 (10) Q And do you know the fellow who actually did - this is a
 (11) model isn t it?
 (12) A Yes
 (13) Q Do you know the fellow who did that?
 (14) A Yes Jerry Gault
 (15) Q And do you believe that within its own limits, that it is a
 (16) reasonably accurate depiction of how the oil flowed through
 and
 (17) out of Prince William Sound?
 (18) A Yes
 (19) Q And are you familiar with from your own knowledge and
 (20) study, are you familiar with the currents that operate on these
 (21) areas of Prince William Sound where the oil comes to go?
 (22) A Yes
 (23) Q First let me - let me bring that up so we can - this is
 (24) Defendants Exhibit 4831 And what is that Doctor?
 (25) A That is a LANSAT picture of Prince William Sound It was

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- (1) taken sometime in 1973
 (2) Q Now when LANSAT does this they don't have the little
 (3) arrows and lines in it do they?
 (4) A No not at all This was the famous picture which was used
 (5) by various researchers one from University of Alaska to study
 (6) sediment transport in this area And the reason we chose it to
 (7) demonstrate currents is because you can see a sediment plume
 (8) following here from the Copper River Delta and entering the
 (9) Sound through Hinchinbrook Entrance which is what I
 explained
 (10) earlier Sediments get in there and they take the oil the
 (11) hydrocarbons with them It's not very clearly visible
 (12) I'd like to demonstrate more fully what the currents look
 (13) like We've superimposed some currents the deep important
 (14) currents the Alaska coastal current which follows the coast
 (15) closely here but splits here and enters the sounds
 (16) Q It enters through Hinchinbrook Entrance?
 (17) A Yes
 (18) Q You have shown basically two routes for that current within
 (19) the Sound and so there's no confusion about this one of those
 (20) currents is pretty strong and the other one isn't strong?
 (21) A That's right
 (22) Q You can't tell that from this drawing but that's true
 (23) isn't it?
 (24) A That's right
 (25) Q Which is the weaker of the currents?

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- (1) A Well this is a very weak current area and so is this we
 (2) just looked at on Gault's picture where the spill occurred but
 (3) the current system goes through the entire Sound The entire
 (4) Sound is caught up into what's called intercyclonic into a
 (5) counter current counterclockwise current system which tends
 (6) to transport any floating materials in this general direction
 (7) Q And because of this current is it known how long water
 (8) remains in Prince William Sound or how long it takes to use
 (9) a term that's been used before to flush the Sound?
 (10) A Well the surface waters in Prince William Sound on
 (11) average are flushed every two to three weeks or so in the
 (12) main part of the Sound
 (13) Q Is that a rare - a rather rapid compared to other parts in
 (14) the world?
 (15) A Yeah
 (16) Q That's pretty rapid?
 (17) A It's a well flushed body of water yes
 (18) Q Does that understanding of the currents and the timing help
 (19) explain the phenomenon that is - is portrayed by the Gault
 (20) model?
 (21) A Yes Gault had to include these currents and they are a
 (22) very important part of the model
 (23) MR SANDERS Your Honor I'm not sure whether this
 (24) 4831 is preadmitted but if it's not I respectfully move its
 (25) admission at this time

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- (1) MR JAMIN No objection Your Honor
 (2) THE COURT There's no objection to it so if it
 (3) hadn't been admitted already it is now
 (4) MR SANDERS Thank you
 (5) BY MR SANDERS
 (6) Q Then coming back to the Gault model I take it from what
 (7) you just told us that the spill in this first day March the
 (8) 25th at noon didn't have a strong current operating on it?
 (9) A That's correct
 (10) Q All right Let's take it down to about four days later
 (11) All right? This is noon on the 28th four days after the
 (12) spill and this is - the oil has now gotten into an area where
 (13) the two currents that you've portrayed in the previous exhibit
 (14) can operate on it, correct?
 (15) A Yes
 (16) Q Do you know and does anyone know what currents operated
 to
 (17) get it to this point?
 (18) A The big difference between the first picture and the second
 (19) one is that there was a storm occurring on March 26th and the
 (20) following day That was the big event which moved the slick to
 (21) the southwest and partially into the strong current system and
 (22) also against the shorelines and that's the result of that you
 (23) see on this scene which is on March 28
 (24) Q Let's take another look at it two days later and finally
 (25) let's take a look at it on April the 7th

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- (1) All right Now based upon this model and other
 (2) information do you have an opinion as to how long it took a
 (3) certain significant proportion of the oil to leave Prince
 (4) William Sound?
 (5) A Yes In April 7 here, the leading edge and the main slick
 (6) was already gone out of the Sound The previous scene, which
 (7) was March 30, I believe, showed the leading edge of the slick
 (8) right here
 (9) Q Okay All right And this model is a model that was used
 (10) or generated by and used by NOAA?
 (11) A Yes
 (12) Q And NOAA is what?
 (13) A National Oceanographic and Atmospheric Administration
 (14) Q They operate at least in this context underneath the
 (15) Coast Guard?
 (16) A They're the science advisor to the Coast Guard, the haz mat
 (17) branch in particular
 (18) Q Within a certain period of time which I would like to give
 (19) the Ladies and Gentlemen of the Jury, do you know
 approximately
 (20) what percentage of the oil that was spilled by the Valdez left
 (21) the Sound by way of this route?
 (22) A Well I would say by May 1, which is the end of this model
 (23) run that we've used about 35 percent has left the Sound, and
 (24) that's based essentially on this modeling that NOAA has done
 (25) Q And did NOAA have an estimate of how much left the Sound

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- (1) during this time frame?
 (2) A That would be their estimate
 (3) Q That s theirs?
 (4) A Yes
 (5) Q And you agree with it?
 (6) A Well yes Well I have no reason to disagree
 (7) Q Well you don t have to explain that Do you agree with
 (8) it?
 (9) A Yes
 (10) Q So 35 percent of the oil that was spilled left the Sound in
 (11) the first few weeks?
 (12) A Roughly
 (13) Q Roughly
 (14) A I should say these are only estimates The model is not
 (15) exact and there were other things that happened Some of the
 (16) oil was picked up and that s not modeled
 (17) Q And you re right, we need to make it clear this is an
 (18) estimate 35 percent of 11 million gallons of oil left within
 (19) the first two or three or four weeks?
 (20) A Yes
 (21) Q This way as an estimate?
 (22) A Yes
 (23) Q And then the amount that evaporated of this oil that s an
 (24) estimate too isn t it?
 (25) A Yes

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- (1) Q Now on your previous chart, that exhibit which was
 (2) admitted in evidence you said from 20 to 30 percent of all the
 (3) oil Do you have - can you give the Ladies and Gentlemen of
 (4) the Jury based on your expertise a - a little tighter
 (5) estimate than 20 to 30 percent?
 (6) A Well I ll give you my best estimate That s 25 percent
 (7) right in the middle of that range
 (8) Q Were there any tests that you asked to be performed or that
 (9) were performed that aided you in tightening up this?
 (10) A Yes My estimate is really based on an experiment that was
 (11) done in the cold room at Exxon Production Research Company
 (12) Q And that is what allowed you to narrow down from 20 to 30
 (13) percent to roughly 25 percent?
 (14) A Yes
 (15) Q But that still is an estimate?
 (16) A That s right
 (17) Q And did NOAA make an estimate on that?
 (18) A Yes The latest estimate NOAA made was 20 percent
 (19) Q Okay So that s within the original range that you gave
 (20) and, as we ll explain later on is the difference in those two
 (21) significant?
 (22) A NOAA s range I might add is from 18 to 25 so I m within
 (23) their range as well
 (24) Q Is there any significance between those two?
 (25) A As you ll see it s not very important

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- (1) Q All right Now roughly then as an estimate 40 percent of
 (2) the oil that was spilled this 11 million gallons I take it
 (3) then landed on shore somewhere in Prince William Sound?
 (4) A Yes
 (5) Q That s the 40 percent we want to deal with now Now the
 (6) 40 percent of the 11 million gallons that was washed ashore
 (7) that was the biggest part of this mess did most of this
 (8) ultimately get taken up someway or another?
 (9) A Yes Most of it has been removed from the shorelines
 (10) Q We re going to get to that point in a minute but let s
 (11) talk about how that happened What ways was this oil removed
 (12) from the shore?
 (13) A Essentially three ways One was the cleanup the cleanup
 (14) operation removed by people One was natural cleansing by
 (15) ocean, by wave forces and tides, and the third was nature s way
 (16) of taking care of hydrocarbons, biodegradation biological
 (17) decomposition of the hydrocarbons
 (18) Q Well of the three forces - well actually Mother Nature
 (19) is part of the - is a big part of the biodegradation process
 (20) too right?
 (21) A Yes
 (22) Q Of the two forces that worked on this cleanup who did the
 (23) better job?
 (24) A Well no question nature did most of it
 (25) Q Let s talk a little bit about the cleanup that was done

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- (1) Is it possible to actually relate the amount of human cleanup
 (2) to this 40 percent?
 (3) A Not accurately I ve estimated less than a quarter
 (4) Q Okay And the reason for the inaccuracy is that the
 (5) cleanup calculations include both solid waste and liquid waste
 (6) correct?
 (7) A Yes
 (8) Q And the liquid waste they didn t draw a distinction
 (9) between what had been skimmed off the water in the first few
 (10) days and weeks of the spill and what was skimmed up that was
 (11) cleaned off the beaches correct?
 (12) A That s correct
 (13) Q So you really can t tell?
 (14) A But in addition the estimates of how much was recovered
 (15) are also not very precise
 (16) Q The solid waste estimates?
 (17) A That particularly yes
 (18) Q Where was there a 50 percent margin of error on the
 (19) calculations statistical analysis of the solid wastes?
 (20) A Yes something like that
 (21) Q So a relatively small percentage of the oil that was on the
 (22) beaches on the rocks, was cleaned up by human beings?
 (23) A Yes, sir
 (24) Q And the rest of it was done by Mother Nature?
 (25) A Correct

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- (1) Q Did you have occasion to study the ways and processes that
 (2) Mother Nature used to clean up this - wait a minute I m
 (3) sorry Strike that I want to make a point here
 (4) When the solid waste cleanup occurred, was that solid waste
 (5) picked up and taken somewhere else and properly disposed
 (6) of?
 (7) A Yes
 (8) Q Now when the cleaning of the rocks other than by the
 (9) methods that produce solid waste like the digging and the
 (10) wiping and all that that was done by spraying water on the
 (11) rocks?
 (12) A That s correct
 (13) Q And of course when that happens the oil washes back into
 (14) the water correct?
 (15) A Yes
 (16) Q Now, did that oil coming off from the human cleanup effort
 (17) with the hoses, did that get back out into the Sound?
 (18) A No that was picked up The work sites were boomed off,
 (19) double or triple booms and the oil was picked up
 (20) Q All right I want to show you as an illustration of this
 (21) Exhibit Number -
 (22) MR JAMIN 607
 (23) MR SANDERS Defendants Exhibit 607
 (24) BY MR SANDERS
 (25) Q Would you describe to the Ladies and Gentlemen of the Jury
 what they probably already know those yellow lines in the bay

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- (1) there what are those?
 (2) A These are the booms That s the primary boom and you see
 (3) the brown coloring here from the oil that has been washed off
 (4) the shoreline This is a typical shoreline washing activity in
 (5) Sleepy Bay July of '89 and there s the secondary boom which
 (6) will prevent anything that goes through the first boom or most
 (7) of what could go through the first boom from escaping and
 (8) there s some absorbent boom used there to pick up what may
 (9) have
 (10) escaped the first boom
 (11) There s no skimmer This could be a skimmer Skimmers
 (12) would come to the scene intermittently to pick up the oil that
 (13) has been collected inside this primary boom
 (14) Q Eventually whatever was collected within these two booms
 (15) was skimmed up correct?
 (16) A Yes
 (17) MR SANDERS For that limited purpose Your Honor I
 (18) move the admission of this exhibit
 (19) (Exhibit 607 offered)
 (20) MR JAMIN No objection
 (21) THE COURT There being no objection Defendants
 (22) Exhibit 607 is admitted
 (23) (Exhibit 607 received)
 (24) MR SANDERS Thank you
 (25) BY MR SANDERS
 Q Now can anyone say to an absolute certainty that

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- (1) absolutely no particles of oil escaped those two booms?
 (2) A No There were machines downstream from these
 (3) operations
 (4) Q Now but the effort was made, at least to keep that to an
 (5) absolute minimum?
 (6) A Yes
 (7) Q And we re going to discuss in a couple of minutes in
 (8) connection with Mother Nature the difference between oil that
 (9) sneaked through that way and entered the Sound as compared
 (10) to
 (11) oil that was spilled initially in Prince William Sound Let s
 (12) go now to - take that off - to Mother Nature
 (13) You studied the process of natural cleansing that occurred
 (14) after the cleanup efforts had stopped the summer of 1989
 (15) because of the weather and went into the fall and winter storm
 (16) season in Prince William Sound?
 (17) A Yes
 (18) Q Were you surprised by what you found?
 (19) A Yes and no We all expected that winter storms would
 (20) remove a lot of oil but seeing how fast that went and how
 (21) efficient that was was a surprise
 (22) Q As a matter of fact, you were euphoric about that, weren t
 (23) you?
 (24) A Yes at times I was
 (25) Q Did you publish a paper?
 A Yes
 Q And that paper described the process and provided data so

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- (1) that the scientific community or the world at large could see
 (2) what had happened?
 (3) A Yes we think we had a very unique data set very complete
 (4) data set from a number of sites that were monitored in Prince
 (5) William Sound
 (6) Q Now in your euphoria did you overproject how good a job
 (7) Mother Nature was doing?
 (8) A Well, turned out that projecting - that we observed trends
 (9) which showed that the larger portion of what had been there in
 (10) the fall of '89 was removed during the following winter If
 (11) you projected those trends quantitatively, assuming that the
 (12) same percentage would be removed every year, those
 (13) projections
 (14) were overoptimistic
 (15) Q And you made those projections didn't you?
 (16) A Yes, I did
 (17) Q And the experience of the next year and the next year
 (18) showed you that you d been overly optimistic about that?
 (19) A Yes
 (20) Q But nevertheless the - was this paper that you did was
 (21) that a peer reviewed paper?
 (22) A Yes
 (23) Q Was it peer reviewed, though, in the same sense that we've
 (24) come to understand that papers are peer reviewed by scientific
 (25) society?
 A The paper was published in the proceedings of the

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- (1) International Oil Spill Conference and that does not rank at
 (2) the same rank as papers by professional society and does not
 (3) receive the same depth of peer review It does go through –
 (4) Q Little bit lower in ranking then?
 (5) A Yes
 (6) Q Now the other natural process other than this storm wave
 (7) grinding moving around action is what?
 (8) A Biodegradation
 (9) Q All right Would you briefly describe for the Ladies and
 (10) Gentlemen of the Jury what is biodegradation?
 (11) A Biodegradation is the decomposition of hydrocarbons in
 (12) this case hydrocarbons by natural bacteria that are able to
 (13) digest and get energy and multiply by eating these
 (14) hydrocarbons so it's the natural decomposition of petroleum
 (15) hydrocarbons
 (16) Q All right, and is this – has this been observed before the
 (17) Exxon Valdez oil spill?
 (18) A Oh yes that's a very well known phenomenon Petroleum
 (19) hydrocarbons occur essentially everywhere in the environment
 (20) and there are bacteria and other microbes that can utilize
 (21) them
 (22) Q As a matter of fact when you're drilling for oil you want
 (23) to keep those away from your oil don't you?
 (24) A That's right It turns out there are even hydrocarbon
 (25) degrading bacteria in reservoirs at great depths

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- (1) Q And that's a problem in that sense and in this case it was
 (2) a benefit?
 (3) A Yes, can be a problem if it plugs up your well bore yes
 (4) Q Now did you all seek to help this process along?
 (5) A Yes
 (6) Q What did you do how did you do it?
 (7) A There was a major effort that resulted from this task force
 (8) that I mentioned earlier to move into the field quickly with a
 (9) new technology which is called bioremediation It is based on
 (10) the theory that perhaps the bacterial growth the action of
 (11) these microbes can be accelerated if you feed them the right
 (12) fertilizer If they're limited with some nutrients if they
 (13) lack some nutrients you provide those nutrients to make them
 (14) grow faster There's plenty of oil there there's plenty of
 (15) food They might need some nutrients There was a successful
 (16) development we developed in cooperation with EPA,
 (17) Environmental
 (18) Protection Agency
 (19) Q Were you directly involved in this bioremediation?
 (20) A Yes, in the summer of 1990
 (21) Q We're all concerned with did harm occur during the course
 (22) of these two cleanups so I want to ask you specifically about
 (23) this When biodegradation occurs when these organisms
 (24) come up
 (25) and eat the oil do they give off any sort of toxic molecules
 (26) when they do that?
 (27) A Well, I'm aware that there has been some concern about
 (28) what

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- (1) We call intermediate products of metabolism intermediate
 (2) stages of oxidizing this but I believe that problem has been
 (3) put to rest by at least two studies that I've seen
 (4) Q How does it get put to rest?
 (5) A Well the first study was one done by or funded by National
 (6) Marine Fisheries and that study shows that at least in an
 (7) environment where petroleum hydrocarbons weather these
 (8) intermediate products occur such low concentrations and
 (9) produced so slowly and further biodegraded or reduced so
 (10) rapidly they never build up so it was not a problem
 (11) Q When one of these organisms eats the oil does it – does
 (12) that oil still exist?
 (13) A Well, an organism –
 (14) Q Like in the stomach of microorganisms?
 (15) A Well they don't eat the oil These organisms convert
 (16) hydrocarbons molecule by molecule They use enzymes to
 (17) make
 (18) chemical changes on little bitty molecules one at a time
 (19) Since there are trillions of them it makes a big difference
 (20) over time
 (21) Q But the end result of that process is that something that
 (22) is harmful?
 (23) A No The end result is what we call mineralization The
 (24) hydrocarbons the organic molecules are finally transformed
 (25) into water and CO₂ just as if you were burning diesel in your
 (26) car

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- (1) Q So the end result of bioremediation is to transform these
 (2) oil molecules some of which we know are toxic into something
 (3) that is no longer toxic?
 (4) A That's right
 (5) Q Now when Mother Nature extracted through storms and
 (6) waves
 (7) and tides the oil from the shoreline that oil that came off
 (8) had to go somewhere didn't it?
 (9) A Yes
 (10) Q And it went into the water didn't it?
 (11) A Yes
 (12) Q As a matter of fact was there an effort to try to boom
 (13) some of these areas to try to slow that down a little bit or
 (14) contain it?
 (15) A Yes, yes
 (16) Q It didn't work did it?
 (17) A Sometimes it did sometimes it didn't
 (18) Q Didn't work all the time?
 (19) A No when you had a storm you lost your booms
 (20) Q So tell us then about the potential for harm as best
 (21) scientists can analyze this from the oil that got washed back
 (22) into the water
 (23) A Well I think the best way to do that is to compare that
 (24) with the initial impact of the spill itself At that time
 (25) and the point I want to make is whatever was washed off the
 (26) shorelines was in no comparison similar in any way to what

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- (1) happened initially with the spill
 (2) Q You want to compare it in order to say there was no
 (3) comparison?
 (4) A Sorry
 (5) Q The concentration that comes off of this kind of action is
 (6) much much much less than the concentration that was
 (7) spilled right?
 (8) A Yes it's two things First the oil is weathered by now
 (9) evaporation has occurred and it has weathered more Some of
 (10) these PAHs have been washed out or biodegraded And
 (11) what comes off the shoreline comes off the shoreline
 (12) piecemeal Every storm takes some out every tide will take
 (13) some out and in a storm, every wave will take some out and the
 (14) more it's taken out in a big storm the more vigorously it gets
 (15) diluted
 (16) Q And dilution goes back to your example I think a while
 (17) ago of a drop of milk in a swimming pool?
 (18) A Yes
 (19) Q If it comes off in gradual amounts the dilution effect
 (20) takes away its ability to do as much harm anyway?
 (21) A That's right Once it's diluted below a certain limit it
 (22) can't do any harm anymore
 (23) Q I take it you're telling the Ladies and Gentlemen of the
 (24) Jury you can't rule out it did some harm coming back off the
 (25) beaches?

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- (1) A That's correct
 (2) Q But can you say to a reasonable degree of scientific
 (3) certainty or can you quantify that harm for us?
 (4) A Well I would say it was minimal risk to the environment
 (5) from what came off the shorelines after the oil had initially
 (6) stranded
 (7) Q And did some of that that came off the shorelines did it
 (8) eventually flush out just the way that the original slick in
 (9) part got flushed out?
 (10) A I think almost all of what came off the shoreline Let me
 (11) qualify that In the first summer some of what came off the
 (12) shoreline would restrand on other shorelines There was a lot
 (13) of oil floating around in the Sound and there was reoiling
 (14) going on We could see that and the shoreline mapping team
 (15) observed that
 (16) In the second summer the quantities that came off were so
 (17) small still visible but still so small that no significant
 (18) reoiling was observed So most of it went out of the sound
 (19) Q Now I want to concentrate in the final area for your
 (20) testimony I want to concentrate on what was left
 (21) A Okay
 (22) Q You've described the processes for the beaches and how
 (23) cleaning resulted in the oil coming off and either being
 (24) flushed out transformed into some other organism that is no
 (25) longer oil or no longer dangerous or sunk or got washed out as

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- (1) sediment which was biologically inert
 (2) Now let's talk about what's left First let's ask you
 (3) where is what's left?
 (4) A Most of it is in coarse grained boulder type shoreline
 (5) below the surface
 (6) Q All right and why is it that that's still there?
 (7) A That's where oil was able to penetrate the deepest but it
 (8) was also the area where storms could remove much of it, but
 (9) until now they have not removed all of it Some of it is left
 (10) in what we call wave shadows or in areas that are beyond the
 (11) depth to which the sediments have been reworked Every
 (12) storm,
 (13) the bigger the storm the more the sediments are reworked and
 (14) therefore, the shoreline's clean but there's a depth limit to
 (15) that
 (16) Q In other words some oil on these rocky more high energy
 (17) beaches that were - is there a characteristic of these that
 (18) they were heavily oiled in the first place?
 (19) A Yes
 (20) Q And the oil sunk down through a lot of rocks and into a
 (21) sediment where it stopped?
 (22) A Yes, sir
 (23) Q All right Now this is the same kind of thing that you've
 (24) been studying all your life right except it's going up the
 (25) other way?
 (26) A Yes yes I'm very familiar with the concept that a

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- (1) viscous fluid cannot very easily penetrate into a fine grained
 (2) sand
 (3) Q In addition to that, in this particular environment there's
 (4) another break on it isn't there It can't go below the water
 (5) level, can it?
 (6) A Yes
 (7) Q Why is that?
 (8) A It floats on water So the oil penetration is naturally
 (9) limited at someplace below the surface
 (10) Q So I take it then you're telling us there is a natural -
 (11) a two-fold natural bottom that limits where the oil can go that
 (12) still exists under these rocks and places?
 (13) A Yes
 (14) Q So in other words if it's going to get out cause anymore
 (15) mischief, it's going to have to come up, out the sides and up,
 (16) right?
 (17) A Yes
 (18) Q And the way that that is done or has been done over the
 (19) past four or five years is if a big enough storm comes in there
 (20) and rearranges the rocks to take away the protection then the
 (21) oil can get out and then it's taken off by the storm action?
 (22) A That's correct
 (23) Q And once again, the quantity, we'll get to the quantities
 (24) in a minute but when it comes out, it's going to come out
 (25) under the same conditions that you described the oil that came

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- (1) off in Mother Nature s cleaning of the oil that was obvious
 (2) it s going to come off in low concentrations correct?
 (3) A Little bit at a time yes
 (4) Q And it s going to be weathered oil when it comes off?
 (5) A Yes
 (6) Q And it's going to be greatly diluted once it hits the
 (7) water?
 (8) A Yes
 (9) Q And do you have an opinion on whether how harmful or
 (10) dangerous that little bit of oil is when it comes off?
 (11) A That can t be very harmful at all
 (12) MR SANDERS Your Honor this would be a good time to
 (13) take a break
 (14) THE COURT Take our first recess at this time We ll
 (15) be in recess for 15 minutes
 (16) (Jury out at 10 00 a m)
 (17) (Recess from 10 00 a m to 10 16 a m)
 (18) (Jury in at 10 16 a m)
 (19) THE COURT Mr Sanders, you may continue
 (20) MR SANDERS Thank you Your Honor
 (21) BY MR SANDERS
 (22) Q Dr Jahns we had been discussing the oil that was in a
 (23) specific kind of location that is below the surface and
 (24) predominantly in these high energy beaches which had this
 (25) rock
 (26) and sediment over cover correct?

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- (1) A Yes
 (2) Q Kind of acts like an armor?
 (3) A Yes
 (4) Q Now is there a name that you and others have used to
 (5) describe this kind of oil?
 (6) A Yes I call it sequestered oil because it s somehow
 (7) sequestered, taken away from the natural process of
 (8) biodegradation
 (9) Q And it is so far removed from the process of biodegradation
 (10) that it doesn t - biodegradation doesn't do an awful lot with
 (11) it very quickly?
 (12) A Let me clarify It doesn't biodegrade, because it s still
 (13) concentration For biodegradation to be effective it has to
 (14) be dispersed either in a fine layer or in small droplets so you
 (15) have these oil-filled pores or maybe even bigger chunks sitting
 (16) down there and the bacteria can t get to it
 (17) Q Are there different grades or quantities used to describe
 (18) this sequestered oil?
 (19) A There are different types yes The biggest - the bulk of
 (20) that is subsurface oil that we discussed
 (21) Q Now what are the other kinds of oil that remain?
 (22) A Well, the others are part of the surface oiling conditions
 (23) that are still observed One of them would be oiled mussel
 (24) beds that weren t cleaned to protect the mussels in the cleanup
 (25) or tar mats that you can find in particularly low energy

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- (1) environments or some small areas where coats oil coatings
 (2) have survived and tar balls mousse patties there are various
 (3) descriptions for them depending on the size and appearance
 (4) Q Let me show you I think this is an example of one of those
 (5) things This is Defendants Exhibit 458 Is that an example
 (6) of the stain that you described earlier?
 (7) A That s an example of a transition between a coating and a
 (8) stain It s a very thin stain but still thick enough to be
 (9) sticky enough to hold some spruce needles to it, and that s
 (10) really the distinction
 (11) Q When was this picture taken?
 (12) A This was taken from LaTouche in July of 93 I believe
 (13) Q Now the properties or - I m going to ask you the same
 (14) question about the danger or the concern factor for these other
 (15) things you described Let s first go to the mussel beds
 (16) Mussel beds you said were not cleaned?
 (17) A There were a number of mussel beds that were so dense that
 (18) there was - the rule was established that they should not be
 (19) cleaned in the cleanup even if they were heavily oiled
 (20) Q Who accomplished that rule?
 (21) A That was the - well the FOIC ran the show so NOAA
 (22) advised them that these mussel beds should not be cleaned
 (23) Q Now the jurors have heard so many initials in this trial
 (24) that FOIC won t mean a thing Who is FOIC?
 (25) A FOIC is the Coast Guard admiral He s the federal on scene

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- (1) coordinator
 (2) Q Let s call him that if we have to refer to him again
 (3) instead of an initial The rule s established by the on scene
 (4) coordinator the federal on scene coordinator and that rule
 (5) was you don t go in and tear up these mussel beds?
 (6) A That s correct
 (7) Q Now the oil that s underneath these mussel beds is that
 (8) oil capable of doing harm?
 (9) A Perhaps a little bit but it would be minimal
 (10) Q Does it harm the mussels?
 (11) A Apparently not Mussels seem healthy
 (12) Q And have those beds been studied?
 (13) A Yes they ve been -
 (14) Q Are you aware of those studies?
 (15) A I'm more aware of how much oil is left in the mussel beds
 (16) There was a survey done in 1993
 (17) Q Now let s go to another area Are there areas where oil
 (18) still persists in lower energy beaches?
 (19) A Yes Those typically would be described or would be in the
 (20) form of small tar mats or asphalt patches
 (21) Q And what are the - what are the characteristics of that
 (22) particular oil?
 (23) A Well, they consist of an oil residue which is mixed up
 (24) with a matrix of sand, so the oil serves as the glue to make a
 (25) little layer of sand that has cohesion to it and lies on the

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- (1) surface It s weathered but if you break it open the
 (2) interior is not as weathered as the outside so you can still
 (3) smell some but it s still weathered
 (4) Q Now if you can still smell it that means it still has
 (5) polycyclic aromatic hydrocarbons?
 (6) A Yes there s still some in there
 (7) Q Why weren t these cleaned?
 (8) A Some of them may have been overlooked and I have a
 theory
 (9) that - well they do form over time and I have a theory that
 (10) they form by oil droplets percolating up It s part of
 (11) nature s cleaning mechanism Every time a tide enters it
 (12) tends to raise oil particles and if they rise to the surface
 (13) and hit something impermeable like a rock or an existing thin
 (14) tar mat or coating they lay underneath but that s just a
 (15) theory
 (16) Q Now is there other evidence of oil that remains in Prince
 (17) William Sound another category?
 (18) A Well, there s a subsurface oil we talked about that
 (19) Q Right
 (20) A And I mentioned the smaller deposit the various
 (1) descriptions of them mousse patties which is really the
 (2) subsurface oil seeps to the surface that shows up as a mousse
 (3) patty or tar balls Small pieces of tar mat if you wish
 (4) Q Now the oil that exists under the mussel beds, the oil,
 (25) that exists locked inside these tar mats or in these coves

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- (1) that - where it hasn t been removed is this oil potential
 (2) danger harmful?
 (3) A It would be minimal in my assessment
 (4) Q Why?
 (5) A Because it s released only very slowly By the very nature
 (6) of the oil persisting that tells you it s only disappearing or
 (7) being released to the environment very slowly, so it can t do
 (8) much harm
 (9) Q All right Now let s talk about how much there is Have
 (10) you come to a conclusion or an opinion as to how much of this
 (11) original oil that was spilled by the Exxon Valdez persists or
 (12) remains in the environs of Prince William Sound?
 (13) A In terms of the - what I described as the sequestered oil
 (14) not fully degraded?
 (15) Q Right
 (16) A Yes I believe that that - my judgment is that that is
 (17) less than one percent of the oil that was originally spilled
 (18) Q All right Now you used the word and you use words
 (19) carefully you said your judgment?
 (20) A Yes
 (21) Q This is not a hard and fast calculation is it?
 (2) A No
 (3) Q It s an estimate?
 (4) A Well I have another estimate If you ask for my best
 (25) estimate, that s much less I m trying to be careful here

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- (1) I m making an estimate and that estimate is a thousand barrels
 (2) to name a round number But I m careful enough that that
 (3) estimate is not very accurate
 (4) To make a statement that I can fully stand behind, I say my
 (5) professional judgment is that it s highly unlikely to be more
 (6) than one percent of the original oil spilled, which would be
 (7) 2 600 barrels about
 (8) Q So that s your - that s -
 (9) A That s my outside guess
 (10) Q That s your outside and but your real estimate is that
 (11) it s something less than that?
 (12) A Yes
 (13) Q All right Now what do you base that estimate on?
 (14) A It s mostly based on a survey that was done last summer
 (15) Q And who conducted that survey?
 (16) A Exxon
 (17) Q And can you compare that survey to other surveys that had
 (18) been done previously?
 (19) A Well there had been annual surveys which were billed as
 (20) joint surveys because they were conducted under the guidance
 (21) and jointly with the federal and state agencies, operated by
 (22) Exxon but under the guidance and observations by state
 agencies
 (23) and land owners
 (24) Q All right Can you compare those prior surveys to this in
 (25) terms of how comprehensive it was, what area it covered those

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- (1) kinds of things?
 (2) A Yes I can From - it is evidenced from the results and
 (3) from the scope of the survey, that the last survey, the one
 (4) done in 1993 by Exxon, was the most comprehensive survey, as
 (5) far as residual oil how much more is left out there is
 (6) concerned
 (7) Q All right And how can you tell the Ladies and Gentlemen
 (8) of the Jury that this covered more than the previous survey?
 (9) A Well the shoreline length surveyed was more than in 1992
 (10) The number of segments surveyed was more than in 1992 and
 the
 (11) amount of oil found was more than in 1992 Obviously that
 (12) amount didn t increase over time, so it must have been there
 (13) before We just didn t find it in 1992
 (14) Q Is it possible that there is some residual oil out there
 (15) that was not found by the survey?
 (16) A I m sure there is
 (17) Q Is that one of the reasons why you round your estimate
 (18) upward?
 (19) A Yes
 (20) Q To cover that eventuality?
 (21) A Yes Even my thousand barrel estimate includes an
 (22) allowance for the oil we didn t find But over and above that,
 (23) there might be more than that
 (24) Q And to make it clear this survey did not include every
 (25) inch of shoreline on Prince William Sound did it?

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- (1) A That's right. And it did not include every inch there was
 (2) of oil.
 (3) Q And it also did not include every - pits weren't dug at
 (4) every beach to look underneath, right?
 (5) A That's right, and you can't dig pits everywhere. You have
 (6) to make a selection.
 (7) Q Now, this percentage, something less than one percent
 (8) that's left, to the extent that it exists subsurface in these
 (9) sequestered areas, why didn't Exxon go get that oil?
 (10) A That goes really back to a decision that was made in 1990
 (11) where a study was undertaken, a two-fold study - study. One
 (12) part of that study was to design some equipment that could do
 (13) just that, excavate the beaches, remove the sediments, wash
 (14) them and put it back. That was one part of the study.
 (15) The other part of the study, spearheaded by NOAA, was to
 (16) determine whether this type of activity, beach excavation and
 (17) cleaning, would have any what was called net environmental
 (18) benefit, what was called the net environmental study, or NEBA
 (19) study.
 (20) Q And whose study was that?
 (21) A NOAA was leading it. The State agencies and Exxon
 (22) participated.
 (23) Q And was a decision made, based upon either one or both of
 (24) those studies, as to whether somebody ought to go out there
 (25) and dig up these beaches to get that little remaining oil?

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- (1) A Well, no. NOAA concluded from the NEBA study that there
 (2) would be no net environmental benefit, I guess. On the
 (3) contrary, there would be net environmental harm if the massive
 (4) excavation job were to be undertaken.
 (5) Q Is it possible, given what you've told us about how storms
 (6) and waves and tides operate on this kind of oil, and knowing
 (7) what you know about sequestered oil and how it behaves, is it
 (8) possible that next week a large proportion of that which is
 (9) left as sequestered oil could be removed?
 (10) A No, since this is the summer. It could happen in the
 (11) winter.
 (12) Q Okay.
 (13) A If you have a large storm in early winter at a high tide
 (14) that's very important when these storms occur, could, for
 (15) instance, cleanup what's left of subsurface oil on Point Helen
 (16) or most of it?
 (17) Q I wanted to ask you about Point Helen. I got a picture of
 (18) Point Helen, and while the machine is bringing that up -
 (19) MR SANDERS: And, Your Honor, this is the - what the
 (20) exhibit looks like, and that's Exhibit 446, if I may, and with
 (21) counsel and the Court's permission, I'd like to change to a
 (22) kind of a blow-up of that picture, because right now I'm not
 (23) interested in what's written down there.
 (24) THE COURT: Is this a plaintiff or defendant's 446?
 (25) MR SANDERS: I'm sorry, Defendants' 446.

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- (1) BY MR SANDERS
 (2) Q Now, before we talk about that picture, do we - based on
 (3) the surveys, do you know where the largest percentage of this
 (4) sequestered oil is?
 (5) A Yes, it's at Point Helen.
 (6) Q Do you know what this is a picture of?
 (7) A Yeah, that's a picture of the - of the beach at Point
 (8) Helen. It's a boulder, cobble beach. We're looking from the
 (9) upper intertidal towards the lower intertidal, and we see two
 (10) people there digging a pit. And that's back-breaking work to
 (11) dig pits in this beach, and probably one reason why past
 (12) surveys
 (13) did not survey this beach as carefully as Exxon did last
 (14) summer.
 (15) Q And so we understand, do you say that most of the
 (16) sequestered oil exists right here?
 (17) A Yes, on a - 100 meter or three-quarter mile stretch of
 (18) that beach.
 (19) Q All right. Is this picture of the beach, which obviously
 (20) shows very little vegetation, is that representative of Point
 (21) Helen?
 (22) A Yes. And it's representative of these, what I call high
 (23) energy environments where large boulders are exposed on the
 (24) surface and there are large spaces between, and that's the
 (25) reason why the oil could penetrate.
- (1) MR SANDERS: Your Honor, I respectfully move the

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- (1) admission of defense Exhibit 446
 (2) (Exhibit 446 offered)
 (3) MR JAMIN: No objection.
 (4) THE COURT: There being no objection, Defendants' 446
 (5) is admitted.
 (6) (Exhibit 446 received)
 (7) BY MR SANDERS
 (8) Q Dr. Jahns, we mentioned where most of the - I mean, where
 (9) based on the survey data, the 1993 survey, where most of the
 (10) sequestered oil was, and I want to show you another exhibit
 (11) which is Defendants' Exhibit 8641. What does this - what does
 (12) this map or chart depict?
 (13) A It shows part of Prince William Sound and identifies five
 (14) areas where the majority of the subsurface oil was found in the
 (15) 1993 survey.
 (16) Q Now, once again, this is based on the survey, correct, '93?
 (17) A Yes.
 (18) Q And is this a chart which you prepared or had prepared?
 (19) A I prepared it, and I made the calculations based on that
 (20) survey, come up with these numbers.
 (21) Q And there is a number that says KN-405. And you've got
 (22) that pen there. You might circle that one.
 (23) A Yes, I'm sorry, I messed it up.
 (24) Q You need to press that - there you go.
 (25) A That area there.

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- (1) Q That is what?
- (2) A That is the 1100 meter stretch near the bottom of that east
- (3) coast of Sleepy Bay of Point Helen where most of the oil
- (4) sits and the number that is shown there as 56 percent of the
- (5) subsurface oil that was estimated is right there
- (6) Q And then there are two other areas below that Is that
- (7) LaTouche?
- (8) A That is LaTouche 20 That is Sleepy Bay where I had 3 9
- (9) percent and LaTouche 15 which is in the northeast corner of
- (10) LaTouche with 7 5 percent
- (11) Q And then above those what is that KN 26?
- (12) A KN 26 that is a part of Knight Island at the entrance of
- (13) Bay of Isles It is a very heavily oiled - it was a very
- (14) heavily oiled beach I know it
- (15) Q And then on up to -
- (16) A On Smith Island there is a particular corner there where the
- (17) subsurface oil did not clean up well 8 5 percent
- (18) Q All of these have the same characteristics as far as the
- (19) high energy beach lots of rocks boulders and stuff?
- (20) A Yes all high energy beaches
- (21) Q All of them were directly in the paths of the spill?
- (22) A Yes
- (23) Q And received substantial oiling initially?
- (24) A Yes
- (25) Q Had you - have you prepared estimates in the past about

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- (1) certain specific parts of - that you testified to here based
- (2) on the earlier surveys?
- (3) A Yes
- (4) Q And did you - was there a survey, this joint survey in
- (5) '92 Did you make a projection based upon that?
- (6) A Yes I was always interested in trends trying to pinpoint
- (7) cleaning trends and I made - I observed some cleaning trends
- (8) based on the surveys on up until 1992
- (9) Q All right Now ultimately - well you've told us that
- (10) there is a difference between the comprehensive nature of the
- (11) '92 survey as compared to the '93 survey?
- (12) A Yes
- (13) Q Do I take it then your estimates were somewhat more
- (14) optimistic about what was left in '92 based on the '92 survey
- (15) than they were on the '93 survey?
- (16) A Yes We found more oil in '93 You can't draw a
- (17) decreasing trend based on the data from 1992 to 1993 If you
- (18) take that data at face value and draw a trend it would go up,
- (19) which of course is unrealistic
- (20) Q Based on the '92 data what were you - did you make a
- (21) specific estimate?
- (22) A Yes In my paper that was published in April of 1993 I
- (23) drew conclusions regarding the trend of both surface oiling and
- (24) some types - the most heavy type of subsurface oiling based on
- (25) surveys that were conducted in 1992 and earlier years

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- (1) Q And in that - that paper based on that survey you were
- (2) focusing on something called OP?
- (3) A Yes
- (4) Q What is OP?
- (5) A OP is a subsurface oiling condition the most heaviest -
- (6) the heaviest category and it stands for oil filled pores
- (7) What happens - an unfortunate title but it describes a
- (8) condition where when you dig a pit and you open up the
- (9) sediment, oil will seep out of it That is the most heavy
- (10) condition we have
- (11) Q You made an estimate concerning OP oil-filled pores, based
- (12) on the 1992 data as to what?
- (13) A It was an estimate of - well, I used estimates that had to
- (14) be derived in the surveys to draw a trend of the size of area
- (15) or the total area still underlain by that type of oil
- (16) condition This was not a volume estimate like we're talking
- (17) about earlier but an area estimate
- (18) Q And you - you estimated that it was about the size of a
- (19) basketball court?
- (20) A Yes In 1992 the amount, the area found to be underlain
- (21) by this OP condition was less than the size of a basketball
- (22) court The area I remember was 3700 square feet
- (23) Q That was based on the 1992 survey?
- (24) A Correct
- (25) Q And do you have an opinion on the accuracy of that now

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- (1) based on the '93 survey?
- (2) A Well, there was probably more of that in 1993 I say
- (3) probably because that number - or that type of oiling
- (4) condition was not separated out again in the estimates that
- (5) were done in the field but we found more subsurface oil so I
- (6) suspect there probably was also more OP than we had in 1992
- (7) Q Now just so I haven't missed it - well first let me
- (8) bring up another exhibit
- (9) THE COURT Is 8641 admitted?
- (10) MR SANDERS I'm sorry Your Honor I lost my - I
- (11) move the admission of 8641
- (12) MR JAMIN No objection
- (13) THE COURT There is no objection to it Defendants
- (14) Exhibit 8641 is admitted
- (15) (Exhibit 8641 received)
- (16) BY MR SANDERS
- (17) Q This, Dr Jahns is exhibit - Defendants Exhibit 5505 A,
- (18) alpha I was going to ask you before I put this up, but I just
- (19) couldn't stand the surprise did you - did other people try to
- (20) do the same sort of thing with the mass balance that you have
- (21) done?
- (22) A Yes
- (23) Q And who was that other group?
- (24) A There is a paper by a group from NOAA principal author
- (25) being Doug Wolfe dealing with the question of mass balance for

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- (1) the Exxon Valdez spill
 (2) Q And is Defendants Exhibit 5505 a general comparison of
 (3) your estimate to what NOAA found in '92?
 (4) A Yes That's a comparison I prepared
 (5) Q All right Now we talked earlier about the differences in
 (6) these estimates Why is the difference between the evaporation
 (7) figure as between you and NOAA and the difference between
 (8) the
 (9) amount under recovered that applies to biodegradation why do
 (10) we not care about those particular differences?
 (11) A We're talking mainly about the five percent difference
 (12) between my estimate for - for evaporation and NOAA's 20
 (13) percent which I mentioned before The reason why that's not
 (14) important is because these volatile light end hydrocarbons if
 (15) they don't evaporate they are the ones that are biodegraded at
 (16) first So if you're off on evaporation by five percent you
 (17) can be sure these compounds will be caught in biodegradation
 (18) early on
 (19) Q All right Now under the NOAA model which is fully a
 (20) year if not more earlier than yours there's a little portion
 (21) right next to the bottom which says less than three percent
 (22) still degrading?
 (23) A Yes
 (24) Q The bottom of their barrel?
 (25) A Right That's right here
 (26) Q And if that had degraded that would add to that 62

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- (1) percent?
 (2) A Yes
 (3) Q And so the difference between - essentially between you
 (4) and NOAA is the extent of biodegradation? Perhaps over this
 (5) period of time that's the difference between their survey and
 (6) yours?
 (7) A Yes and no Overall NOAA's estimate has more
 (8) biodegradation but it doesn't show here because NOAA used a
 (9) more detailed model for biodegradation Wolfe's assumption
 (10) was
 (11) that only 16 percent of the oil was totally inert and that
 (12) some - the difference between 16 and 20 which I assumed
 (13) would
 (14) biodegrade very slowly so that's really what that is some of
 (15) that very heavy material
 (16) And maybe I should have pointed out earlier that the lines
 (17) I draw across this barrel are - in defining these categories
 (18) are not very precise Biodegradation is going on in this
 (19) bottom part of the barrel as well I assumed and assumed
 (20) conservatively that it would be 20 percent NOAA assumed
 (21) there
 (22) would be 16 percent and therefore in their model they still
 (23) have - some of that four percent is still degrading but it's
 (24) very heavily degraded And as you said one year later half
 (25) of that would be degraded, would be totally degraded to the
 (26) inert residue
 (27) Q So both of you get to the same bottom line, as we call it,
 (28) correct?

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- (1) A Yes
 (2) Q That there's less than one percent sequestered oil?
 (3) A Right Let me clarify there That number is not directly
 (4) NOAA's report What they say is there's two percent left on
 (5) the shorelines but more than 60 percent of that is refractory
 (6) totally biodegradable material So it's the 40 percent
 (7) difference that I would list here which is 8 percent
 (8) Q So if you make that last calculation which you told us
 (9) about, their estimate is actually more optimistic than your
 (10) estimate?
 (11) A Yes
 (12) Q And the difference between the other 99 percent is you've
 (13) got 25 - five percent more evaporation and they make it up in
 (14) biodegradation is that roughly right?
 (15) A That's right and the one percent difference in what we
 (16) estimate for the recovered oil
 (17) Q All right So ultimately is it your opinion then that
 (18) there is a certain percentage under which - well strike that
 (19) try it again
 (20) What is your opinion as to how much sequestered oil is left
 (21) in Prince William Sound?
 (22) A Less than one percent
 (23) Q And perhaps more importantly would you tell the ladies and
 (24) gentlemen do you have an opinion as to the properties and
 (25) character of that which is left in terms of its capacity to

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- (1) harm the environment? Do you have an opinion first?
 (2) A Yes I do
 (3) Q What is that opinion?
 (4) A It's a minimal risk to the environment That's the way it
 (5) has been characterized by NOAA also in the NEBA study and I
 (6) believe that very much that that's absolutely true
 (7) Q Why is that risk low?
 (8) A Two reasons One is this oil which while often described
 (9) as fresh it is not fresh it is also weathered it degrades
 (10) gradually It has less than half the amount of PAHs that it
 (11) used to have initially when the oil grounded
 (12) And second and perhaps more importantly this oil is
 (13) released only very slowly and if it's released in just the
 (14) right storm as I'm fond of saying, then it's being diluted
 (15) because storms are what creates wave action what creates
 (16) dilution and mixing It's diluted so rapidly that it can't
 (17) harm anything
 (18) MR SANDERS Your Honor I move the admission of
 (19) Defendants Exhibit 5505
 (20) MR JAMIN 5505 A I think it is No objection
 (21) MR SANDERS A excuse me
 (22) THE COURT There is no objection to 5505 A and it is
 (23) admitted
 (24) (Exhibit 5505 A received)
 (25) MR SANDERS With that, Your Honor I have no further

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- (1) questions on direct examination
 (2) THE COURT You may cross-examine
 (3) MR JAMIN May I proceed Your Honor?
 (4) CROSS EXAMINATION OF HANS JAHNS
 (5) BY MR JAMIN
 (6) Q Mr Jahns how many gallons of oil would one percent of the
 (7) amount that spilled from the Exxon Valdez be?
 (8) A About 110 000
 (9) THE COURT What s - a hundred and ten gallons?
 (10) THE WITNESS Yeah He asked how many gallons
 (11) MR JAMIN Thank you Your Honor
 (12) BY MR JAMIN
 (13) Q I wanted to ask you a question sir about 4954 which
 (14) Mr Sanders asked you about just a little bit And the portion
 (15) that s in the - in the nearshore section there that s less
 (16) than a hundred meters from the shore?
 (17) A Yes
 (18) Q Now when are these concentrations - when in time is this
 (19) occurring sir where we estimate the average PAH
 (20) concentrations?
 (21) A I think most of the samples were taken in the summer of
 (22) 1990
 (23) Q 1990?
 (24) A Yes
 (25) Q All right Would it be your opinion that in the nearshore

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- (1) that the numbers would have been pretty much the same right
 (2) after the spill as well?
 (3) A Oh there were perhaps some areas where this was higher
 (4) following beach cleanup for instance
 (5) Q Let me show you a portion of 247 A which is previously
 (6) admitted Plaintiffs 247 A
 (7) (Videotape played)
 (8) MR JAMIN I think that s enough
 (9) BY MR JAMIN
 (10) Q Now as we looked at that video, had you seen it before
 (11) sir?
 (12) A Not that particular video no but I know there was visible
 (13) oil in the subtidal shortly after the spill
 (14) Q And that oil - the jury has seen that before through a
 (15) fellow named Mr Rosenthal who had been hired by the Alaska
 (16) Department of Fish & Game That oil that was being removed
 (17) is
 (18) it your opinion that that was Katalla oil?
 (19) A Oh I don t know where that was taken
 (20) Q It was taken in Herring Bay, sir
 (21) A I do know that some subsurface sporadic subsurface tar
 (22) balls were also observed in some studies, so it does not
 (23) surprise me
 (24) Q With respect to what we just saw is it your opinion that
 (25) that was Exxon Valdez oil?
 (26) A It might well have been yes Or let me add it would not

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- (1) be Katalla oil
 (2) Q And it would not be background oil would it sir?
 (3) A That s right Background oil does not occur in this free
 (4) liquid form
 (5) Q So that would have been - some of that oil in the red
 (6) block on 4954, on the exhibit that s next to you or on the big
 (7) screen -
 (8) A Yes
 (9) Q - that's some of that Exxon Valdez crude?
 (10) A Well I said it might have been There are other sources
 (11) there but it probably was
 (12) Q And that s all I can ask you for
 (13) Let me ask you next, sir about another one that
 (14) Mr Sanders showed you, 5266 A and you talked a little bit
 (15) with Mr Sanders about a toxic component from the middle part
 (16) of the drum?
 (17) A Yes
 (18) Q And that was those PAHs?
 (19) A Yes
 (20) Q Those poly aromatic hydrocarbons?
 (21) A Correct
 (22) Q Now you re not suggesting to us, sir, that that top
 (23) element which is yellow is not toxic to the animals that -
 (24) that - or other species that get in its way, are you?
 (25) A No And we talked about that that being the - the most

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- (1) toxic portion of the oil, the single ring aromatics
 (2) Q And you re not suggesting that after the spill for a number
 (3) of days there wasn t a serious release of toxic compounds into
 (4) the air, are you?
 (5) A I do not know that it was serious There was a significant
 (6) release -
 (7) Q I ll take significant sir
 (8) A - of hydrocarbons into the air
 (9) Q On that bottom layer that is the darker brown you're not
 (10) suggesting to us if - that included asphalts, did it not?
 (11) A Yes
 (12) Q And you re not suggesting to us that if asphalts, let's say
 (13) smothered barnacles, that that would not be toxic to the
 (14) barnacles are you?
 (15) A No No I mean -
 (16) Q When you re talking about toxicity in this middle range, in
 (17) what I ll try to say is orange there the middle range of the
 (18) barrel you re talking about chemicals that do things like
 (19) cause cancer is that right?
 (20) A Yeah When I talk about toxicity, I do not talk about the
 (21) smothering effect that fresh oil or thick oil would have on the
 (22) beach
 (23) Q So the oil on the beach could have had a significant effect
 (24) on the plant and animal life just by smothering, right?
 (25) A Yes, and it did

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- (1) Q I want to just clarify a couple other things We talked -
 (2) or Mr Sanders showed you four stills from something he called
 (3) the hindcast model and it's a model that NOAA put together
 (4) Do you remember that sir?
 (5) A Yes
 (6) Q Let me pull one of them up here, which is Exhibit 6062 and
 (7) it displays the data about the oiling through a series of dots
 (8) does it not?
 (9) A Yes
 (10) Q Now does the NOAA Hindcast model show us where all the
 (11) oil went?
 (12) A Not in every detail No it can't do that
 (13) Q Why can't it sir?
 (14) A Because there's no way to describe the intricate process
 (15) the processes involved all the wind patterns all the current
 (16) patterns all the vortices in these infinite detail
 (17) Q All right And so we might see a particular - we get an
 (18) idea of the general flow of the oil out in a southwesterly
 (19) direction, do we not?
 (20) A Yes Yes
 (21) Q And the NOAA Hindcast model is good for that?
 (22) A Yes, and it's good for more
 (23) Q All right But it doesn't - it doesn't tell us just
 (24) because we're seeing oil in this area right here that for
 (25) example that port of - that part of Montague Island which is

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- (1) Zaikof Bay, was not oiled, does it?
 (2) A You could not conclude that with certainty, no
 (3) Q And if the - if for example the HAZMATs model showed
 (4) oiling going over into - let's get 543 up here if we can
 (5) If the NOAA HAZMAT model showed oiling going into the
 (6) Alaska Peninsula the area in between Alaska Peninsula and
 (7) Kodiak Island - which is called Shelikof Strait is it not?
 (8) A Yes
 (9) Q And it didn't show any oiling on the eastern shore of
 (10) Kodiak - just take a second and we'll look at this together
 (11) If it showed oiling sir in the general direction out the
 (12) Sound in a southwesterly area along the southern coast of the
 (13) Kenai Peninsula, a little bit up into Cook Inlet and then down
 (14) between the Alaska Peninsula and Kodiak Island in Shelikof
 (15) Strait that wouldn't - that wouldn't tell us for sure that
 (16) there wasn't oil on the whole eastern shore of Kodiak Island,
 (17) would it?
 (18) A No Based on that model alone no
 (19) Q Because of the model's limitations?
 (20) A Yes
 (21) Q We'll make reference to this again, but I'm going to take
 (22) it down for a moment so you can see the screen
 (23) Now, you told us that the surface waters in Prince William
 (24) Sound were flushed out generally or, for the most part every
 (25) two or three weeks?

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- (1) A Yes
 (2) Q And you're not saying when you make that statement that
 (3) there's flushing in every bay or fjord of Prince William Sound
 (4) are you?
 (5) A There's flushing in every bay but not necessarily at that
 (6) rate
 (7) Q Not at that rate?
 (8) A Right
 (9) Q In fact some of the bays may take months to flush out is
 (10) that not true sir?
 (11) A No I don't think that's right I've seen tidal flushing
 (12) calculations that would imply that it's much faster
 (13) Q Much faster than several months?
 (14) A Yes
 (15) Q What's your best opinion sir?
 (16) A Well I've seen the calculations for two particular bays
 (17) one being Passage Cove and another being Snug Harbor and
 (18) those
 (19) were on the order of a few tidal cycles three or five
 (20) Q That's actually less than a couple weeks?
 (21) A No It's less than - yes Well to get it out of the
 (22) bay not necessarily out of the Sound To get it out of the
 (23) bay then it's in the Sound and it's to be carried into the
 (24) current patterns
 (25) Q You'll agree with me sir will you not that there are
 (26) certain bays and certain coastlines that take significantly

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- (1) longer than two to three weeks to flush the water out?
 (2) A Yes And there's a difference to what happens between
 (3) dispersed oil which would be flushed out with the water no
 (4) questions asked and oil on the surface which is also subject
 (5) to winds
 (6) Q Let's talk about that for just a moment Is it - you used
 (7) the number 40 percent as a stranding number for the oil in
 (8) Prince William Sound on the beaches there?
 (9) A Yes and I accepted Gault's number there
 (10) Q And you've come to an independent judgment as to that?
 (11) A That that is reasonable yes
 (12) Q All right And is that 40 percent of the oil that left the
 (13) Valdez?
 (14) A Yes
 (15) Q All right So that 25 percent had evaporated already and
 (16) it's - 40 percent and 25 makes 65 and another 35, that's the
 (17) whole hundred percent?
 (18) A Yes and ignoring for the time being the cleanup
 (19) Q Yeah let's do that Now when is that 40 percent number
 (20) accurate sir?
 (21) A Perhaps not at any given time because the oil was sloshing
 (22) back and forth
 (23) Q And - but -
 (24) A But it's meant to be the number of the amount of oil that
 (25) hit the shoreline at some time

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- (1) Q Okay And is that a number that you come to by the end of
 (2) the summer in 1989?
 (3) A No I think that was in the early summer in the May time
 (4) frame
 (5) Q The May time frame?
 (6) A Yes
 (7) Q All right So as of May, 1989 your judgment is that
 (8) roughly 40 percent of the oil from the Exxon Valdez was on the
 (9) beaches in Prince William Sound?
 (10) A Well as I said some of it may have been at any given
 (11) time some of it may have been in transit from one beach to
 (12) another or piled up against a beach
 (13) This estimate is based on the Gault model which had a
 (14) certain rule If a particle, one of those 10 000 particles in
 (15) the model would cross a shoreline it was considered stuck
 (16) there
 (17) Now it might have been stuck just in front of the
 (18) shoreline and never really touch a rock, I don't know that
 (19) But in that sense that's what this estimate means
 (20) Q Okay And I just want to get a feel for that estimate
 (21) A Yes
 (22) Q As I understood your direct testimony, we've got roughly 25
 (23) percent evaporating, roughly 40 percent and you've refined it
 (24) now either on the shores or near the shores?
 (25) A Yes

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- (1) Q Or coming into the shores in Prince William Sound and 35
 (2) percent has gotten out of the Sound?
 (3) A Right
 (4) Q Translate for me in gallons what that 40 percent would
 (5) represent, sir, given the amount that in your mind left the
 (6) Exxon Valdez
 (7) A A little over four million gallons
 (8) Q About four million gallons?
 (9) A A little over, yes
 (10) Q Now of the 35 percent that left the Sound do we know that
 (11) some ended up along the beaches in the Kenai Peninsula and
 (12) in
 (13) the - in the area down here sir?
 (14) A Yes
 (15) Q And is that because of the general flow of the currents
 (16) along this southern portion of the northern Gulf of Alaska?
 (17) A Yes The Alaska coastal current will take it that way
 (18) Q And do we know that some of the oil came into Cook Inlet
 (19) and lodged in areas that I'm pointing to right now on the
 (20) north shore here?
 (21) A I'm not specific on shoreline segments but generally
 (22) yes
 (23) Q All right And do we know that some of the oil went over
 (24) into - besides the Cook Inlet went into the Shelikof Strait
 (25) area and lodged itself on the Alaska Peninsula?
 (26) A On some segments there yes

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- (1) Q And do we know that some of that oil went and lodged itself
 (2) on Shuyak Island and Afognak Island and Kodiak Island?
 (3) A Yes
 (4) Q And that that oil went all the way down passed Chignik on
 (5) the Alaska Peninsula?
 (6) A It went passed Chignik, yes what was floating, and floated
 (7) even farther ended up in the Pacific Ocean
 (8) Q All right Now that's a portion of that 35 percent that
 (9) we talked about -
 (10) A Yes
 (11) Q - that had been sort of freed from Prince William Sound in
 (12) 1989?
 (13) A Right
 (14) Q Can you tell me now what percentage of that 35 percent
 (15) ended up on those beaches sir?
 (16) A No I don't have - haven't made an estimate of that
 (17) Q Haven't made that calculation?
 (18) A No
 (19) Q And Exxon didn't ask you to make that calculation, did it?
 (20) A Right
 (21) Q Now I want to spend just a bit of time talking about the
 (22) report that was underneath the testimony that you've given us
 (23) today And do I understand correctly that you had generated a
 (24) couple of reports in early 1993?
 (25) A Are you talking about my paper?

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- (1) Q Your paper was part of your expert report, was it not?
 (2) A Yes I published one paper and that became an expert
 (3) report one in 1993
 (4) Q All right And did you have an initial -
 (5) MR JAMIN Thank you Mr O'Neill I don't know
 (6) why - the jury can see me that way, they need to look at Mr
 (7) Jahns
 (8) BY MR JAMIN
 (9) Q You had a couple of papers, though, you had generated
 (10) One
 (11) was called the Fate of the Oil from the Exxon Valdez?
 (12) A Yes a perspective
 (13) Q And there was another paper there?
 (14) A Yes
 (15) Q What did that deal with sir?
 (16) A With natural cleansing of the shorelines oiled by the Exxon
 (17) Valdez
 (18) Q All right
 (19) A Those were not in 1993 That's why I hesitated when you
 (20) said two reports
 (21) Q Let's get initial dates when they were prepared
 (22) A Excuse me?
 (23) Q The first dates when they were prepared
 (24) A Prepared? The first paper was prepared in 1990 and the
 (25) second in 1992 I don't quite know what date they were
 (26) finished It was just finished

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- (1) Q And those papers were available were they not at a
 (2) presentation that was given in early 1993 through an entity
 (3) called ASTM?
 (4) A I don't recall that my - both of my earlier papers were
 (5) made available there It's possible
 (6) Q Let's clarify ASTM first What is that?
 (7) A The American Society for Testing and Materials
 (8) Q And which one of your papers is it your recollection was
 (9) available there?
 (10) A Well the third one
 (11) Q What is that one?
 (12) A That's the report by me and Koons I was the lead author
 (13) on that the Fate of Oil From the Exxon Valdez a Perspective
 (14) Q That was offered to plaintiffs' counsel as one of your
 (15) expert reports was it not?
 (16) A Yes
 (17) Q Now do I understand correctly sir that that initial
 (18) report the Fate of the Oil From the Exxon Valdez a
 (19) Perspective which was submitted as an expert report in this
 (20) litigation was in your view not a scientific paper at the ASTM
 (21) conference?
 (22) A It was submitted as a perspective or overview paper - I'm
 (23) sorry, it was presented as a perspective overview paper It
 (24) was not submitted for publication at the conference
 (25) Q It was not an original scientific contribution?

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- (1) A No It was an overview based on my earlier paper and on
 (2) results pertinent results from many of the other papers that
 (3) were given at that same conference That's why I characterized
 (4) it the way you just asked
 (5) Q It was a compilation that - that came from other papers
 (6) then?
 (7) A Yes
 (8) Q And Mr Koons was actually the lead author of that paper?
 (9) A No I was The earlier publication with the same title had
 (10) Mr Koons as the lead author We switched lead authorship
 (11) Q All right And you've prepared the supplemental expert
 (12) report in this litigation and you gave us that in February of
 (13) 1994?
 (14) A Yes
 (15) Q And in preparing the 1994 report sir you relied, as you
 (16) had in the previous version, upon a number of other papers and
 (17) expert reports prepared by others did you not?
 (18) A Yes on my own calculations
 (19) Q All right And regarding the oiled shorelines, you relied
 (20) on work done by Mr Harrelson and his group, which included
 (21) Mr Trend Mr Reimer and Mr Snook, did you not?
 (22) A Yes Also one of Mr Harper which is another one of the
 (23) oil geomorphologists
 (24) Q And those persons are?
 (25) A OGS oil geomorphologists

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- (1) Q Oil geomorphologists And you don't claim to be an expert
 (2) in oil geomorphology do you?
 (3) A No but that is included as a sub - as a subarea of
 (4) geology
 (5) Q When you spoke to us about oiled mussel beds you relied
 (6) on
 (7) work done by Mr Paul Boehm did you not?
 (8) A Yes with regard to the quantitative estimate of oil
 (9) retained in these mussel beds
 (10) Q And Mr Boehm is a petroleum chemist?
 (11) A Yes I think that's correct
 (12) Q And you're not are you?
 (13) A Not specifically no
 (14) Q And you relied as well on the work on Mr Page who is a
 (15) chemist?
 (16) A I think he's a chemist yes
 (17) Q And you relied on the work of Mr Gilfillan whose
 (18) expertise is in biology and specifically intertidal biology
 (19) correct?
 (20) A Yes
 (21) Q And you're not a specialist in intertidal biology are you?
 (22) A Oh no
 (23) Q You relied on Mr Neff's expertise?
 (24) A Yes
 (25) Q His area of expertise is marine toxicology?
 (26) A I believe so

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- (1) Q And you're not a marine toxicologist sir?
 (2) A No
 (3) Q And you relied on the work on Babcock and others?
 (4) A Very little
 (5) Q What area is Mr Babcock's area of specialty do you know?
 (6) A No
 (7) Q All right
 (8) A I know they made surveys of mussel beds and I referred to
 (9) those surveys in that regard I didn't really rely on it
 (10) Q With respect to the section of your report and the section
 (11) of your testimony today relying on natural petroleum seeps you
 (12) relied on work performed by Mr Page Mr Boehm and Mr
 (13) Bentz?
 (14) A Among other things, yes among other authors
 (15) Q And Mr Douglas, too?
 (16) A Yes, and Becker and Manen There's a whole row - a whole
 (17) slough of people that have published and routed on these
 (18) seeps
 (19) Q And Mr Douglas is an analytical chemist?
 (20) A I think so
 (21) Q All right With respect to the section dealing with
 (22) biodegradation you relied on Mr Harner?
 (23) A Not very much on him but he's a co author on a paper that
 (24) I relied on that is a definitive paper on the bioremediation
 (25) effort that was done
 (26) Q All right And you relied on Mr Harner Mr Atlas and Mr
 (27) Prince for those comments?

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- (1) A There they were also co authors I think the name I'm
 (2) looking for is Bragg Bragg's paper on bioremediation is the
 (3) most definitive Excuse me
 (4) Q Certainly sir Is Mr Harner a statistician?
 (5) A Yes
 (6) Q Is Mr Atlas a microbiologist?
 (7) A Yes
 (8) Q And is Mr Prince a microbiologist?
 (9) A Yes
 (10) Q And do I understand that you're not a microbiologist?
 (11) A That's correct
 (12) Q Now with respect to your comments on hydrocarbons in the
 (13) subtidal sediments, did you rely on some work done by Page
 (14) and
 (15) Armstrong?
 (16) A Yes
 (17) Q And is Mr Armstrong's area of specialty marine biology?
 (18) A I believe so
 (19) Q And you relied as well on work done by Mr Owens?
 (20) A Not on subtidal Was the question subtidal?
 (21) Q Yes sir
 (22) A No I - Mr Owens was a co author with me in the
 (23) shoreline cleaning paper He's an oil geomorphologist that had
 (24) nothing to do with subtidal work
 (25) Q You did rely on Armstrong?
 (26) A Yes

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- (1) Q And Armstrong's area of specialty is marine biology?
 (2) A I think so
 (3) Q Now you talked with us specifically about an area that was
 (4) fingerprinting, did you not, in your direct testimony?
 (5) A Yes
 (6) Q Would you agree with me that fingerprinting, and
 (7) specifically Exxon's representations about fingerprinting, are
 (8) controversial?
 (9) A I don't think they're controversial There are different
 (10) ways of fingerprinting, and scientists authors of different
 (11) papers may have disagreed but I don't think that makes them
 (12) controversial As far as I know these authors have gotten
 (13) together and looked at each other's technique and I hope that
 (14) the differences have been removed
 (15) Q Let's explore it sir First though, as to your
 (16) representations as to fingerprinting you didn't do modeling in
 (17) the fingerprinting area did you?
 (18) A No
 (19) Q And you didn't do peer review for publication of articles
 (20) in that area?
 (21) A I don't recall any
 (22) Q All right And is it not true that NOAA disagreed with
 (23) many of Exxon's fingerprinting conclusions?
 (24) A Initially I believe
 (25) Q All right

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- (1) A Or I know
 (2) Q May I approach the witness Your Honor?
 (3) I'm going to show you sir what's been marked Plaintiffs'
 (4) 3086 Do you want to take a moment to familiarize yourself
 (5) with that but I want to ask you first sir whether or not
 (6) that is a report that NOAA generated on April 27, 1993?
 (7) A This is a statement dated April 27th, yes
 (8) Q And is it entitled the NOAA Response to Exxon's Challenge
 (9) to the Exxon Valdez Natural Resource Damage Assessment
 (10) Data
 (11) Base?
 (12) A Yes
 (13) Q All right Let me get you to focus on the page that's I
 (14) had up when I - when I came to you, sir It looks like you've
 (15) got it again
 (16) A Yes
 (17) Q Specifically with respect to fingerprinting, does NOAA say
 (18) at the bottom there is no evidence based on sampling before
 (19) the spill that indicates widespread contamination of shallow
 (20) subtidal sediments by Katalla or any other oil In fact, the
 (21) most extensive study of hydrocarbons in the marine sediments
 (22) of
 (23) the Sound was conducted by NOAA from 1977 through 1980 to
 (24) determine background oil contamination level of intertidal
 (25) sediments in mussels prior to anticipated oil pollution
 (26) effects Exxon's claim of widespread subtidal contamination by
 (27) Katalla oil is not accurate for intertidal or shallow subtidal

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- (1) sediments where EVC has been clearly documented
 (2) Did I read that properly sir?
 (3) A Yes
 (4) Q Is that your understanding of NOAA's position?
 (5) A It's my understanding it was NOAA's position on April 27
 (6) but I think they've been wrong and I think they know that now
 (7) Q The report that you gave us in February of 1994 and on
 (8) which you've relied today is it fair to say, sir, that you
 (9) relied on the work of persons from fields that you have no
 (10) particular expertise in yourself such as microbiology?
 (11) A I have some expertise in microbiology It is true that I
 (12) synthesized information that was produced by people having a
 (13) number of specialties, and that's been my strength throughout
 (14) my career sir
 (15) Q All right But the areas that you synthesized from are
 (16) outside the area of expertise that you've been certified to
 (17) talk about in this courtroom are they not?
 (18) A Some of them are, yes
 (19) Q It's not geology it's not engineering it's not petroleum
 (20) engineering?
 (21) A Microbiology is neither of those yes
 (22) Q And several of those other areas were outside the area of
 (23) expertise for which you've been certified in this court?
 (24) A Yes
 (25) Q All right Now I want to look for a moment sir, at that

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- (1) time – the pattern of work that you've been involved with on
 (2) the spill since the spill and focus a little bit on that
 (3) From 1989 to '90 1990 was your main activity to take
 (4) Woodward Clyde shoreline survey data and try to interpret and
 (5) extrapolate the trends that were evident in the data?
 (6) A From the fall of '89 on yes
 (7) Q All right
 (8) A One of the areas I worked in yes
 (9) Q And from that work your paper regarding natural cleaning
 (10) resulted?
 (11) A Yes
 (12) Q And then subsequent to that you were a member of Exxon's
 (13) natural resource damage assessment and litigation support
 (14) group?
 (15) A Yes
 (16) Q From approximately October 1 1990 through December 31
 (17) 1992 is that correct?
 (18) A That's correct
 (19) Q And in that capacity – well let me ask one more thing
 (20) You took over the position of environmental coordinator in the
 (21) fall of '91?
 (22) A Yes
 (23) Q In that capacity you became personally responsible for
 (24) supervising the scientific studies that were being conducted by
 (25) Exxon personnel and contractors that Exxon hired to look into

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- (1) spill related issues did you not?
 (2) A Environmental issues, yes
 (3) Q All right And members of the NRDA group compared the
 (4) claims being made by plaintiffs against the findings of the
 (5) NRDA group?
 (6) A Not by the plaintiffs in these proceedings We were
 (7) talking about natural resource damage assessment
 (8) Q All right
 (9) A So we were – and there were no plaintiffs I believe at
 (10) the time We were comparing with the results that were
 (11) obtained by government – by the Trustees who has – who had
 (12) also undertaken environmental studies
 (13) Q Sir, let me ask you, I've put by your right shoulder there
 (14) your deposition transcript up on the judge's bench
 (15) If I may approach for a second, Your Honor
 (16) I'm going to show you the pagination of this, and we're
 (17) going to be referring to the pages that are there I'm going
 (18) to ask you to go to page 115 if you would
 (19) MR SANDERS Where are you, counsel?
 (20) MR JAMIN Page 115 of the deposition
 (21) MR SANDERS Thank you
 (22) BY MR JAMIN
 (23) Q Are you on that page, sir?
 (24) A I see one page – page 115 yes
 (25) Q All right I'm going to ask if this question was given to

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- (1) you and if you made this answer
 (2) Well sir have you ever investigated the factual basis
 (3) of any of the claims asserted against Exxon by any of the
 (4) classes of people who claim to have been harmed by the Exxon
 (5) Valdez oil spill
 (6) And you answered "In our work we have compared the claims
 (7) that are being made with our own findings That was one of the
 (8) purposes of our existence Our group was here to assist the
 (9) lawyers in countering the claims it made against them
 (10) litigation support
 (11) Did you give that question – or excuse me Did you give
 (12) that answer to that question sir?
 (13) A Yes I gave that answer
 (14) Q All right Now in fact the NRDA group was there to
 (15) assist the lawyers in countering claims made against the
 (16) company is that not right?
 (17) A We were hired to provide factual information to the lawyers
 (18) so they could develop whatever procedures theories or
 (19) activities they wanted to undertake We were the scientific
 (20) arm of this
 (21) Q But at page 115 you gave this answer Our group was here
 (22) to assist the lawyers in countering the claims it made against
 (23) them litigation support did you not?
 (24) A Yes but I was referring to claims as our work was claims
 (25) of damages to the environment

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- (1) Q All right When you became a member of the NRDA and
 (2) litigation support group you saw your role as providing
 (3) factual information to those individuals who would undertake
 (4) the formulation of legal theories that were designed to deny
 (5) those who claimed to have been victimized by the Exxon Valdez
 (6) oil spill compensation for their claims Is that statement
 (7) true sir?
 (8) A Which page is that on?
 (9) Q You can take a look at 115 10 through 20 sir
 (10) A It's the next question?
 (11) Q It is
 (12) A I'm sorry, I missed that
 (13) Yes And my answer was The way I saw my role was to
 (14) provide factual information to those who would undertake what
 (15) you just characterized
 (16) Q What I just characterized?
 (17) A Yes
 (18) Q All right sir
 (19) A And the assumption there is that that's what lawyers do
 (20) but I didn't get into that
 (21) Q Now, later on, let me ask this – you understood that you
 (22) were supporting Exxon's litigation effort to deny those who
 (23) have claimed to have been harmed by the Exxon Valdez oil spill
 (24) compensation for their claims –
 (25) Well, let me ask you this, sir Was this question given

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- (1) and this answer given at 115 21 You understood that you were
 (2) assisting by providing factual information the attorneys for
 (3) Exxon who were trying to deny those who have claimed to have
 (4) been harmed by the Exxon Valdez oil spill compensation for
 (5) their claims correct sir?
 (6) And you gave the answer Well I knew I was supporting
 (7) Exxon s litigation effort That was our role in NRDA and
 (8) litigation support
 (9) A Yes I think the answer was clear made clear that I was
 (10) steering away from trying to imply that I knew anything about
 (11) the legal theories that were being constructed
 (12) Q Later on sir you had a consultancy contract with Exxon
 (13) under which you - it was agreed that you would act as a
 (14) coordinator for assisting in the preparation for the papers for
 (15) the ASTM conference, did you not?
 (16) A Yes
 (17) Q And that was for work which was performed between
 (18) January 8
 (19) and April 30 of 1993?
 (20) A Yes
 (21) Q All right Now let s take a look at that paper that you
 (22) did with Mr Koons, the Fate of Oil From the Exxon Valdez a
 (23) Perspective
 (24) MR SANDERS Which one? There s two of them
 (25) MR JAMIN Let s take a look at the first version in
 (26) which Mr Koons was the lead author Is that correct?

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- (1) THE WITNESS Yes
 (2) BY MR JAMIN
 (3) Q And was that paper reviewed by the public - by a public
 (4) affairs representative of Exxon sir?
 (5) A I m sure they saw it, yes
 (6) Q It was reviewed by them was it not?
 (7) A I m sure they read it yes
 (8) Q And the paper was also reviewed by lawyers for Exxon,
 (9) specifically Jim Stevens and John Redman?
 (10) A Yes I believe that's right
 (11) Q And Jim Stevens and John Redman are part of the Exxon
 (12) corporate legal department?
 (13) A Yes
 (14) Q And you incorporated comments from Mr Stevens and/or
 (15) Mr Redman in the final version of the paper that was submitted for
 (16) publication did you not?
 (17) A I think that s correct
 (18) Q And you understood that you were submitting the paper to
 (19) Mr Stevens and Mr Redman for the purpose of having them
 (20) review the paper prior to its being published?
 (21) A Yes
 (22) Q And one of the purposes of having the lawyers review it was
 (23) to make sure that the paper was not inconsistent with Exxon s
 (24) litigation strategy?
 (25) A Was that the question that was asked or is that something I

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- (1) said?
 (2) Q Let s take a look at Page 314 of your deposition, sir
 (3) A What was the page number?
 (4) Q 314 sir And starting at page -
 (5) A Sorry It s the second part of it I didn t have that
 (6) Q Sure You have 314 sir?
 (7) A Yes
 (8) Q And was this question given at line 9 And one of the
 (9) purposes to review it was to make sure that the paper was
 (10) consistent with Exxon s litigation strategy, correct?
 (11) And you answered Or not inconsistent with its litigation
 (12) strategy I would rather say
 (13) Is that correct?
 (14) A Yes, because -
 (15) Q All right So that when I asked you sir whether one of
 (16) the purposes for the review was so that it would be not
 (17) inconsistent with Exxon s litigation strategy the answer to
 (18) that is that is correct?
 (19) MR SANDERS Objection, Your Honor, he - I wanted so
 (20) I wouldn t cut him off but he is cutting off the witness
 (21) BY MR JAMIN
 (22) Q Is that correct, sir?
 (23) A Yes And I can give my additional answer now We were
 (24) giving factual information to the lawyers so it s obvious they
 (25) needed to know what factual information we were producing,
 and

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- (1) if that factual information was inconsistent with whatever
 (2) strategy they had it s obvious they had to change their
 (3) strategy so they needed to know about that
 (4) Q All right, sir Let s go on to the paper entitled Natural
 (5) Cleaning of Shorelines Following the Exxon Valdez Oil Spill,
 (6) and that was by you, along with Bragg, Dash and Owens?
 (7) A Yes
 (8) Q And it was presented to a 1991 oil spill conference in San
 (9) Diego?
 (10) A Yes
 (11) Q And that was the paper that you described with Mr Sanders
 (12) here today?
 (13) A We talked about it yes
 (14) Q Now prior to the publication of that paper it too was
 (15) reviewed by lawyers was it not?
 (16) A Yes as is common practice within Exxon I was not even in
 (17) the - I was not in the litigation support group at that time
 (18) Q So it s common practice in Exxon for the legal department
 (19) to review all papers sir?
 (20) A I can t say that There may be some that they say they
 (21) don t want to see
 (22) Q But you did just say common practice, did you not?
 (23) A It is common practice that as part of the release procedure
 (24) for a paper law would have the opportunity to look at them
 (25) Q All right And it would have been sent to Houston for

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- (1) legal review and to get release permission in this case then?
 (2) A It would have been sent to Houston for release and as part
 (3) of that it may have gone to the legal department as well I
 (4) do not know whether in fact it did Usually there was somebody
 (5) made a decision whether lawyers need to look at it or public
 (6) affairs needs to look at it or who else needs to look at it
 (7) Q All right sir Let me ask you to look at your deposition
 (8) and review what you have told us before on this issue at 318
 (9) A Yes
 (10) Q And we go along here sir prior to the publication of this
 (11) exhibit and I ll represent to you that that s the one we re
 (12) talking about
 (13) A Which line?
 (14) Q On line 21 on 318
 (15) A Yes
 (16) Q Was it reviewed by any Exxon lawyers and you said yes did
 (17) you not?
 (18) A Yes
 (19) Q And then the question is asked by whom, and you say you
 (20) don t recall, you say you wrote the paper when you were in
 (21) Anchorage and it would have been sent to Houston for review
 (22) and then the lawyer in Anchorage was Mike Smith?
 (23) A Right
 (24) Q Those are your words?
 (25) A Yes

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- (1) Q And you say he probably looked at it too?
 (2) A Yes, but you didn t ask about that sir
 (3) Q Was Mr Smith part of Exxon s legal team here in Anchorage?
 (4) A Yes
 (5) Q And it was - the question was then asked was it sent to
 (6) Houston for legal review and you answered for review yes
 (7) for review and release get the release permission
 (8) A Right
 (9) Q Was that your answer?
 (10) A That s what I tried to explain earlier I don t know
 (11) whether it was passed by the lawyers in Houston
 (12) Q So the way it works, you have to obtain management
 (13) approval
 (14) to publish and the law department advises management in that
 (15) process is that what you re saying?
 (16) A Yes Yes
 (17) Q And if you don t get Exxon management approval for a
 (18) paper
 (19) it doesn t get published?
 (20) A That s true
 (21) Q And one of the purposes of Exxon management approval of
 (22) this paper was to ensure that it did not contain any
 (23) information that was contrary to the litigation position of
 (24) Exxon is that true sir?
 (25) A I don t think so
 (26) Q Well, let s take a look at 320 And specifically sir
 (27) 320, line 20 was this question given And one of the - are

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- (1) you with me sir?
 (2) A Yes
 (3) Q And one of the purposes of Exxon management approval
 (4) was to
 (5) ensure that the document that has been marked as Exhibit
 (6) 69904
 (7) and I ll represent to you that s what we re talking about did
 (8) not contain any information that was contrary to the litigation
 (9) position of Exxon correct sir?
 (10) And you said I would assume that law would review it from
 (11) that viewpoint would have reviewed it from that viewpoint is
 (12) that correct?
 (13) A Yes
 (14) Q That was your answer?
 (15) MR SANDERS Read the rest of the answer please
 (16) MR JAMIN I ll be happy to read the rest of the
 (17) answer And you said I was not working in the NRDA
 (18) litigation support group at that time so I was - our work was
 (19) much less subject to lawyer review law department review We
 (20) weren t working for the law department I was working for
 (21) operations
 (22) BY MR JAMIN
 (23) Q Despite that at that time you would assume that law would
 (24) have reviewed the paper?
 (25) A Yes And I know Mike - I m pretty sure Mike Smith in
 (26) Anchorage reviewed it
 (27) Q All right Let s go on sir - or let me just ask you

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- (1) when you were talking with Mr Sanders this morning about that
 (2) particular report which was reviewed by law that s the one
 (3) that you said was overly optimistic about the removal of the
 (4) oil from the beaches was it not?
 (5) A I was overly optimistic at the time The statements I made
 (6) in there were correctly qualified as related - as being based
 (7) on the data obtained earlier that year
 (8) Q Let s go on to speak more generally and I want to talk
 (9) with you for a while about the entire ASTM conference where
 (10) you
 (11) gave one of these as your paper did you not?
 (12) A Yes
 (13) Q And you made a presentation?
 (14) A Yes
 (15) Q All right Now the ASTM conference was a conference in
 (16) which Exxon s consultants published a comprehensive set of
 (17) papers about their scientific findings and their studies in
 (18) Prince William Sound was it not?
 (19) A Yes
 (20) Q And that conference took place in Atlanta in April of 1993?
 (21) A Yes
 (22) Q And the Exxon-sponsored presentations at that conference
 (23) included both professionals that were under the employ of
 (24) Exxon as well as outside consultants that Exxon had
 (25) contracted
 (26) with to perform certain professional services?
 (27) A Yes

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- (1) Q Now in April of 92 you had discovered through your
 (2) employment that a conference had been scheduled by the oil
 (3) spill restoration fund trustees for here in Anchorage had you
 (4) not?
 (5) A Yes
 (6) Q And at that point in time discussions were had as to what
 (7) Exxon's response would be to the Trustee's initiative to
 (8) convene a conference here in Anchorage?
 (9) A Correct
 (10) Q And among the Exxon departments and individuals you
 (11) interacted with about that subject were public affairs your
 (12) own NRDA and litigation support group, the in house legal
 (13) department, the outside lawyers, and management in the form
 (14) of
 (15) a group of people including Mr Mel Harrison?
 (16) A Yes
 (17) Q And between the public affairs people and the lawyers it
 (18) was much more the lawyers who were involved in that process
 (19) because this was a litigation effort is that correct?
 (20) A Yeah We were working for litigation right
 (21) Q And once you had a manuscript which you believed was
 (22) pretty
 (23) much final for what you wanted to submit, you would be
 (24) required
 (25) to send it to a number of different people in different
 (26) departments?
 (27) A Yes
 (28) Q And the people and the departments that would receive the

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- (1) manuscript would include others in the NRDA and litigation
 (2) support group?
 (3) A Yes
 (4) Q And it would include the public affairs department, would
 (5) it not?
 (6) A Yes
 (7) Q Is the public affairs department like a public relations
 (8) department?
 (9) A Perhaps I don't -
 (10) Q Pretty much the same?
 (11) A Perhaps pretty much the same I don't know
 (12) Q And it would also be sent to the legal department for their
 (13) review and comment?
 (14) A Yes
 (15) Q And it was the case that for the ASTM papers that someone
 (16) from the public affairs department would send the manuscripts
 (17) out to other persons within that organization and they would
 (18) have purview on that particular topic as well?
 (19) A Yeah Someone in the public affairs department was
 (20) designated as the coordinator for getting the releases and
 (21) ensuring that those people that needed to see a particular
 (22) paper they had an interest in that area that's what I was
 (23) trying in the response I gave to be aware of that paper yes
 (24) Q But apart from just getting the word out you - you told
 (25) us before that public affairs was reviewing the documents were

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- (1) they not sir?
 (2) A Well whatever the term reviewing means
 (3) Q All right
 (4) A I may have used that term yes
 (5) Q All right And each and every one of the 28 papers that
 (6) were presented at the ASTM conference in April of 1993 were
 (7) approved by Exxon management prior to publication?
 (8) A Yes
 (9) Q And is that level of Exxon management at the level that Mr
 (10) Mel Harrison is on sir?
 (11) A I do not know whether Mel Harrison gave the approval for
 (12) each of these papers or whether it was the lower level
 (13) Q But he was involved in this - the general process of
 (14) preparing the ASTM effort, was he not?
 (15) A The general process, yes, but I do not - well, I'm sure he
 (16) didn't read all the papers
 (17) Q And again one of the purposes of Exxon management
 (18) approval
 (19) was to ensure that the papers did not contain any information
 (20) that was contrary to Exxon's litigation position, is that
 (21) correct?
 (22) A I think we've covered that before and I had - I did not
 (23) say that's correct in my response
 (24) Q All right, sir We'll let what went before go The 28
 (25) papers were approved by Exxon management even if the
 (26) authors
 (27) were not employees of Exxon is that correct?

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- (1) A Yes, of course
 (2) Q I'm sorry?
 (3) A Yes, of course
 (4) Q And had any of those papers not been approved by Exxon
 (5) management Exxon would not have released those papers for
 (6) publication in Atlanta, is that correct?
 (7) A Yes but let me make an addition there There wasn't very
 (8) much that could be done about whether or not you want to
 (9) publish these papers We had committed to publishing a
 (10) comprehensive set of papers at this conference, and
 (11) comprehensive meant not only covering all the areas that we
 (12) had
 (13) worked on but also within each area to describe and
 (14) summarize
 (15) all the information that was contained
 (16) If any of the papers in this case had occurred where the
 (17) lawyers might have taken exception to it, it's the situation
 (18) that I mentioned earlier If the factual information doesn't
 (19) agree with their - with what you call the strategy, then the
 (20) strategy had to change
 (21) We were here to provide factual information for the
 (22) lawyers, and part of this review process was to make sure the
 (23) lawyers learned what the factual information was that we
 (24) provided And the same holds for public affairs
 (25) Q All right Now you didn't make that clear to us in the -
 (26) that position clear to us in the depositions that you'd given
 (27) before?

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- (1) A Yes I m sorry I didn t make it clearer then
 (2) Q All right So we ve got a slightly different view right
 (3) now here in court?
 (4) MR SANDERS Your Honor I object to the
 (5) characterization If he wants to ask -
 (6) THE COURT Let s move on with the questioning We re
 (7) starting to quarrel just a little bit
 (8) MR JAMIN I don t want to quarrel I ll be happy to
 (9) accept the answers
 (10) BY MR JAMIN
 (11) Q Is it true sir that Exxon had a routine and customary
 (12) practice of approving contracts with its outside consultants
 (13) hired in connection with the Exxon Valdez litigation a
 (14) provision that required Exxon s approval of the content of any
 (15) information published by any such consultant?
 (16) A Yes That was standard procedure I m sure Not only in
 (17) our company
 (18) Q Was one of the purposes for publishing the papers at the
 (19) ASTM conference TO publicize Exxon s point of view about the
 (20) state of recovery from the contamination of the Alaska
 (21) shoreline from the oil discharged from the Exxon Valdez?
 (22) A Yes Our scientists had a strong desire to publish the
 (23) information they had developed
 (24) Q Sir do you have some allegiance towards Exxon s position
 (25) in this litigation?

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- (1) A I have a strong allegiance to Exxon
 (2) Q And is that based on your long career with Exxon?
 (3) A Yes
 (4) Q And you have - do you have an interest in the outcome of
 (5) this litigation?
 (6) A In what way do you mean?
 (7) Q Well have you told - told plaintiffs lawyers in
 (8) depositions before that you have an interest in supporting
 (9) Exxon s position?
 (10) A There were questions regarding whether I had a financial
 (11) interest and I don t know whether you re asking about that
 (12) Q Well did you not say in your deposition sir that you had
 (13) an interest in the outcome of this litigation and it was in
 (14) supporting Exxon s position?
 (15) MR SANDERS What page, counsel?
 (16) MR JAMIN 111
 (17) THE WITNESS What page?
 (18) MR JAMIN 111
 (19) THE WITNESS I was asked such questions yes
 (20) BY MR JAMIN
 (21) Q And you indicated affirmatively, sir?
 (22) A Perhaps
 (23) Q All right I ll accept that answer
 (24) Now, let s talk about some of the representations you ve
 (25) made to us about cleanup from the beaches And I think - let

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- (1) me ask first physical processes played an important role
 (2) during the first summer when the stranded oil was still
 (3) relatively mobile?
 (4) A Yes
 (5) Q And you ve talked some about that here today have you
 not?
 (6) A Yes
 (7) Q And some of the liberated oil was subsequently recovered by
 (8) booming and skimming but some drifted onto other
 shorelines?
 (9) A Yes
 (10) Q Do you have any estimate sir for us today as to the
 (11) amount of the oil that came off the beaches in Prince William
 (12) Sound and then restranded on other beaches?
 (13) A I have no quantitative estimate of that but it s a
 (14) significant amount
 (15) Q And when you say significant in that context can you give
 (16) me a range?
 (17) A Well it could have been 10 percent of the - of the oil
 (18) maybe a quarter of the oil that was in Gault s model considered
 (19) to have stranded, may subsequently have gone off that
 (20) particular shoreline and onto another shoreline That s a feel
 (21) I have I have not made a calculation I have not made a
 (22) scientific estimate of that
 (23) Q If that feel is right and 40 percent is initially stranded
 (24) and a quarter of that becomes restranded then the beaches
 feel
 (25) as if 50 percent hit them, is that correct?

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- (1) A I don t understand that
 (2) Q All right If 40 percent was originally stranded -
 (3) A Yes
 (4) Q - and a quarter of that - which would be 10 percent that
 (5) came from the vessel is that right?
 (6) A Yes Yes
 (7) Q - restrands -
 (8) A Yes
 (9) Q - then the different beaches feel the effect of 50 percent
 (10) one way or the other?
 (11) A Oh, I see what you re saying
 (12) Q Is that right?
 (13) A Well these effects are not cumulative in an arithmetic
 (14) sense If you spill a hundred barrels on the beach and you had
 (15) another barrel it doesn t mean it s now suffering one percent
 (16) more damage It doesn t go that quantitatively
 (17) Q Would you agree with me generally that the effect is -
 (18) because of the restranding is a quarter more than the 40
 (19) percent that originally strands?
 (20) A Not the effect but it s more If all of the oil had
 (21) stayed where it first hit the shoreline there would have been
 (22) less damage less oiling obviously, if it had never moved from
 (23) there If it had stayed put there would have been less
 (24) damage less oiled shoreline
 (25) Q All right Now we ve talked about this restranding from

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- (1) the summer As I understand it there were some beaches by the
 (2) fall of 1989 that still had more than 50 percent of their
 (3) surface oiled is that correct?
 (4) A No I would not characterize it that way
 (5) Q Well let me ask you if on west Green Island there was
 (6) still heavily oiled in September a beach that you - that was
 (7) called AP8 with 52 percent average covered you remember that
 (8) one?
 (9) A Yes I m aware of that sort of mapping but that doesn t
 (10) mean 50 percent of the oil that was there was still there
 (11) Q I understand that sir 50 percent of the beach?
 (12) A At the end of the summer of 89 there were some beaches
 (13) that still had areas with more than 50-percent coverage
 (14) Q All right
 (15) A Yes
 (16) Q And that was in September of 1989 was it not?
 (17) A Yes Yes
 (18) Q And was it September 15th that the cleanup ended for 1989?
 (19) A Yes
 (20) Q The Exxon cleanup?
 (21) A Right
 (22) Q All right Now over the course of the next six months a
 (23) substantial amount of oil according to your paper was
 (24) released from that site on west Green Island is that not true?
 (25) A Yes

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- (1) Q And so by your calculations it had diminished to about 20
 (2) percent coverage in March?
 (3) A Okay
 (4) Q You agree with that?
 (5) A Well I don t recall those numbers but -
 (6) Q You ll trust me here today?
 (7) A Yes Yes
 (8) Q All right And some of the re released oil was redeposited
 (9) on other beaches is that true?
 (10) A I don t know that but it may have been Some of it may
 (11) have been yes
 (12) Q Would you - without having to go to your article you
 (13) indicated that in your article at one point is that true?
 (14) A I don t recall that particular sentence
 (15) Q Would you disagree with me that it was there?
 (16) MR SANDERS We ll represent it was there
 (17) MR JAMIN All right Counsel has represented so
 (18) that we can move on and that sounds good
 (19) BY MR JAMIN
 (20) Q Now can you quantify for us generally for this period
 (21) between September when the cleanup ends, until March or
 (22) April when it picks up again in 1990 how much of this oil that is
 (23) being released by Mother Nature and the other factors that
 (24) you ve described ends up on other beaches as stranded oil?
 (25) A No

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- (1) Q Is it something that you ve looked at at all sir?
 (2) A No There were no surveys no mapping shoreline mapping
 (3) surveys done in the winter There was another survey done in
 (4) the next spring and it of course, was compared with this -
 (5) with surveys of last fall but the most rigorous comparison was
 (6) with a survey that was done in the previous summer So the
 (7) year to year surveys were the basis for most comparisons
 (8) Q All right Now I want to talk with you just a bit about
 (9) what you ve done to estimate the amount of oil remaining in
 (10) 1993 which is where you ended up with Mr Sanders, and I
 (11) think
 (12) it was your - your judgment that it s less than one percent
 (13) is that correct?
 (14) A The oil that stays in a recognizable form, sequestered oil,
 (15) yes
 (16) Q All right
 (17) A Excepting this inert residue That s why I emphasized the
 (18) definition
 (19) Q You ll agree with the statement that oil is a contaminant,
 (20) will you not?
 (21) A Yes Can - I m sorry it can be a contaminant It s also
 (22) a very useful product that we use all the time and couldn t get
 (23) by without it
 (24) Q In the right place?
 (25) A Yes
 (26) Q You re not going to argue with me that Prince William

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- (1) Sound in the water that s the wrong place?
 (2) A Yes
 (3) Q So you ll agree that oil is a pollutant when it gets into
 (4) the environment, such as Prince William Sound or the northern
 (5) Gulf of Alaska?
 (6) A Yes
 (7) Q And you re aware of many instances where oil spilled from
 (8) the Exxon Valdez got in not only to the water but also - and
 (9) not only into the lower intertidal area but into the upper
 (10) intertidal area and indeed the supra or above the tidal area?
 (11) A Well that s the same - yes
 (12) Q And that supratidal area refers to anything above the mean
 (13) high tide line does it not?
 (14) A Right but in this context it refers specifically to the
 (15) supratidal berm which is typically a berm of gravel that
 (16) builds up above the supratidal during storm surges
 (17) Q At the high tide mark or above the high tide mark?
 (18) A Just above the high tide mark, yes
 (19) Q Now you were deposed back in November is of 1993, is that
 (20) correct sir November of '93?
 (21) A Yes
 (22) Q And we ve been looking at that deposition a little bit
 (23) today?
 (24) A Right
 (25) Q And back then did you tell us that nobody knows the exact

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- (1) amount of oil that s in the subsurface either aerial wise or
 (2) volume-wise?
 (3) A Yes
 (4) Q And did you tell us that you don t have any clue whatsoever
 (5) as to the volume of Exxon Valdez crude oil that is presently
 (6) below the surface of any of the Alaska shoreline contaminated
 (7) by the spill?
 (8) A No I didn t say that
 (9) Q Let s take a look at 171 of your deposition
 (10) A That was the question but that s not what I said
 (11) Q Let s take a look -
 (12) A Again what page please?
 (13) Q 171 sir Let me ask you to start at line 16 Was this
 (14) question given Now sir do you have any clue whatsoever as
 (15) to the amount of Exxon Valdez crude oil that is presently below
 (16) the surface of any of the Alaska shoreline contaminated by the
 (17) spill from the Valdez?
 (18) And you said at first Yes I know some shorelines are
 (19) free of oil
 (20) And then the questioner said But I m talking about the
 (21) aggregate amount
 (22) And you said I thought you said any No the volume of
 (23) oil the mass of oil that s left on the shorelines
 (24) Questioner yes
 (25) And you said no and you went on to say did you not I

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- (1) defy anybody to have a number That s a problem we ve
 (2) wrestled
 (3) with and nobody has been able to do it
 (4) Is that your testimony, sir?
 (5) A Yes and what I mean is nobody has an accurate number
 (6) Q Now you ve come into court today and you ve made an
 (7) estimate for us?
 (8) A Yes
 (9) Q And that s just an estimate isn t it sir?
 (10) A Yes of course but I ve since -
 (11) Q Because -
 (12) A Since that time I ve gotten much better data than I had
 (13) then
 (14) Q So you wouldn't defy yourself now to come here with a
 (15) number?
 (16) A No
 (17) Q In fact you ve come here with a number?
 (18) A I m sorry I would - I would not defy myself coming up
 (19) with a properly qualified number
 (20) Q And the qualifications to the number here today are that
 (21) it's an estimate?
 (22) A Yes
 (23) Q All right
 (24) A And I ve done more I ve also specified an upper bound
 (25) which is a measure of how accurate or inaccurate an estimate I
 think it is

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- (1) Q All right Now as I understand it we ve got a couple of
 (2) numbers One roughly 40 percent which is oil stranded on the
 (3) beach in 1989 and we ve talked about May ish of 1989?
 (4) A Yes
 (5) Q And we ve got your estimate which is that there s one
 (6) percent out there in 1993?
 (7) A Less than one percent
 (8) Q Less than one percent?
 (9) A Yes
 (10) Q Did you do any work sir or did Exxon do any work to
 (11) quantify how much was out there in 1992?
 (12) A Not volume-wise Not that I m aware of
 (13) Q And was there any work to quantify how much was done
 (14) volume wise in 1991?
 (15) A No not that I m aware of
 (16) Q So your testimony here is about the amount - or your
 (17) judgment here is about the amount of oil that we could find
 (18) more than 4 years after the spill in the summer of 1993?
 (19) A Correct
 (20) Q And you re not testifying here on your direct as to the
 (21) amount that the volume of oil that was out there in 1992 or
 (22) 1991?
 (23) A That s correct
 (24) Q Let s take a look for a moment at the oil that s on the
 (25) beaches and under the beaches Is it your understanding that

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- (1) roughly 31 1 miles of shoreline in Prince William Sound and
 (2) 17 6 miles of shoreline outside of Prince William Sound were
 (3) surveyed by Mr Harrelson and Mr Reimer and the other
 (4) geomorphologists?
 (5) A Yes
 (6) Q And of what was surveyed of the shoreline over 20 percent
 (7) was found to be oiled is that correct?
 (8) A Oiled to some degree Most of that was very lightly
 (9) oiled
 (10) Q All right But oiled to some degree?
 (11) A Yes
 (12) Q And 31 1 miles were surveyed for subsurface oil?
 (13) A I cannot confirm that
 (14) Q I m sorry?
 (15) A I cannot confirm that All the - all the subdivisions
 (16) that were surveyed were surveyed for subsurface oil if there
 (17) was - seemed to be a possibility that it would exist
 (18) Q Well again in the interest of shortness of time do you
 (19) have a recollection that approximately - that more than 25
 (20) percent of the shoreline that was surveyed was found to have
 (21) subsurface oil?
 (22) A No I don t recall those numbers Are you talking about
 (23) the Prince William Sound shoreline maybe or -
 (24) Q Let s take a look at your deposition sir It s Page 381
 (25) That s the blue - the blue book that s next to your right

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- (1) shoulder again
 (2) A Yesterday s deposition?
 (3) Q Yesterday s deposition
 (4) A Again, what page?
 (5) Q Page 381, sir And at line 10 was this question asked,
 (6) and was 31 1 miles surveyed for subsurface oil and the answer
 (7) given yes
 (8) And was 8 73 miles found to have oil the answer yes
 (9) Now and in that 8 73 is a little bit more than 25 percent
 (10) of the amount surveyed and the answer was yes?
 (11) A I think that s a misprint or at least I thought we were
 (12) talking about surface oil Those are the amounts for surface
 (13) oil both the surveys and what was found in Prince William
 (14) Sound
 (15) Yes I remember that I remember these questions I
 (16) remember that I was thinking and reading numbers in a table
 (17) that pertained to surface oiling conditions but it doesn t
 (18) matter Yes, on these 31 miles we also looked - they also
 (19) looked for the presence of subsurface oil
 (20) Q And they found a significant amount of subsurface oil?
 (21) A Yes, but the 20 percent business, 25 percent business,
 (22) that s not right
 (23) Q So you all stand by the over 20 percent of the surface as
 (24) being oiled?
 (25) A In Prince William Sound these are Prince William Sound

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- (1) numbers It s more than 25 percent oiled to some degree
 (2) Q All right sir Let s take a look at some of the - the
 (3) oiling that s out there Mr Sanders showed you a photograph
 (4) and a log on it which displayed some of the oiling, and I
 (5) wanted to show you another photograph of Knight Island
 (6) And you had indicated that Knight Island was an area that
 (7) was still fairly heavily oiled is that correct?
 (8) A Portions of Knight Island yes
 (9) Q And that oil is in the subsurface?
 (10) A At Point Helen in particular yes
 (11) Q Now let s take a look at what is a portion of Plaintiffs
 (12) 6 - 6081 - excuse me which is a portion of Plaintiffs
 (13) 1911 I m going to get the Elmo on if I can
 (14) Now this is - this is a picture - I m going to focus on
 (15) the key just for a moment then we ll take a look at the
 (16) picture together But this photograph was taken in June of
 (17) 93 sir?
 (18) A Yes
 (19) Q And there s - I m going to let you have a quick look In
 (20) fact the problem I have, sir and I ve had the problem all the
 (21) way through is I received originally xerox copies color xerox
 (22) copies but I also later got photographs Let s take a look at
 (23) the photograph together
 (24) At this particular site on Knight Island is there a large
 (25) cobble overburden?

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- (1) A Yes
 (2) Q And underneath the surface is there an indication that
 (3) from about 13 to 18 centimeters down there s something called
 (4) OP?
 (5) A Yes, correct
 (6) Q And is that 13 to 18 centimeters about five to seven inches
 (7) down, something in that range?
 (8) A Yes Yes
 (9) Q And OP stands for oiled pore?
 (10) A Oil-filled pore
 (11) Q And is that defined as where pore spaces are completely
 (12) filled with oil, resulting in oil oozing out of the sediments?
 (13) A Yes
 (14) Q And underneath this layer in this particular picture, is
 (15) there something called HOR?
 (16) A Yes heavy oil residue
 (17) Q And that goes from about 18 to 40 centimeters down?
 (18) A That s correct
 (19) Q And that s from about seven inches down to about 15 inches
 (20) down?
 (21) A Yes
 (22) Q And HOR stands for heavy oil residue?
 (23) A Yes
 (24) Q And that s where pore spaces are partially filled with oil
 (25) residue but are not generally flowing out of the sediments?

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- (1) A That s correct
 (2) Q Now, in this particular pit, do I understand that the
 (3) bottom of the oil was not reached?
 (4) A That s correct
 (5) Q And does that mean that the geomorphologist just didn't dig
 (6) that pit deep enough to tell?
 (7) A That s correct
 (8) Q And if I understand your testimony on direct, though, you d
 (9) go down - the oil wouldn t go down any deeper than where the
 (10) layer is of the water, the water table?
 (11) A That s right
 (12) Q Because the oil floats on that?
 (13) A Yes
 (14) Q So it s not going through to China or anything like that?
 (15) A Yes
 (16) Q Let s take a look at the - at the actual photograph
 (17) together Are you able to distinguish between the heavy oil
 (18) residue -
 (19) A Yes
 (20) Q - and the OP on that?
 (21) A In the layering is somewhat disturbed, because as the pit
 (22) is dug you get some caving in and you get some oil flowing
 (23) out but - if I can get this pen to work
 (24) Q Oh, you can t use that there sir If you would like to
 (25) come down from the stand to show us the difference on this

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- (1) large television set that would be fine
 (2) A If I were the OG the oil geomorphology and I look at this
 (3) pit I would say there is a section here which has the OP
 (4) condition and I would try to expose a fresh portion of that
 (5) surface to ascertain just exactly from where to where I would
 (6) draw that classification And the person that did this
 (7) particular pit said it goes from 18 centimeters down That
 (8) measures from the top of the pit not from the top of the
 (9) armor because that's another foot probably down
 (10) And then below that there's heavy oil residue The oil
 (11) is - the oil is - is still thick in the sediment and I would
 (12) call that HOR
 (13) And then I would make a notation check whether I can get
 (14) down to the bottom of this and if I can't for some reason,
 (15) because either the survey has to stop or the tide is coming up
 (16) or time is just not there then I would make a notation that I
 (17) hadn't reached the bottom of the oiling condition
 (18) Q All right sir You can take the seat again if you'd
 (19) like
 (20) And this photograph was taken by the gentlemen who are out
 (21) on the geomorphology crew for Exxon in 1993?
 (22) A Yes
 (23) MR JAMIN Your Honor I'd like to offer and ask
 (24) permission to publish to the jury the photograph because of its
 (25) clarity, and offer this as 1911-A

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- (1) (Exhibit 1911-A offered)
 (2) MR SANDERS No objection
 (3) THE COURT Plaintiffs Exhibit 1911 A is admitted
 (4) (Exhibit 1911 A received)
 (5) BY MR JAMIN
 (6) Q All right Let's take a look at just a few more of the
 (7) photographs that were taken by Exxon in 1993 and I'd like to
 (8) have - just give - I think we've all got a pretty good idea
 (9) of Prince William Sound at the moment and from your own - I
 (10) hate to do this counsel but - Mr Lynch was behind the
 (11) Barco now he's behind the map
 (12) But this is Knight Island here is it not sir?
 (13) A That's the Knight Island complex yes
 (14) Q So that's where we saw that first photograph?
 (15) A Yes
 (16) Q Now I want to show you next a photograph that was taken by
 (17) the Exxon crew in 1993 from another area Do you know where
 (18) Cape Douglas is?
 (19) A Yes
 (20) Q And is it over in this area sir?
 (21) A Right You're pointing to the right spot
 (22) Q Right about there?
 (23) A Right
 (24) Q So that's over on the Alaska Peninsula below Cook Inlet?
 (25) A Yes

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- (1) Q All right Let's see if we can get an idea of the
 (2) geomorphologist description on this particular one
 (3) Is the description here AP MS patch? I may be able to zoom
 (4) that in a little bit for you sir Would that help?
 (5) A Asphalt patch asphalt mousse patch which is large
 (6) boulders behind bedrock rise near the center of the
 (7) subdivision That would be one of the occurrences in a wave
 (8) shadow
 (9) Q And the AP stands for asphalt?
 (10) A Yes
 (11) Q And the MS stands for mousse?
 (12) A I'm pretty sure yes
 (13) Q And the AP is described as heavily oiled beach sediment
 (14) held cohesively together?
 (15) A Yes That's what I described earlier in my testimony
 (16) Q And the mousse which - we've seen some mousse before
 (17) how would you describe that?
 (18) A As sticky brown substance
 (19) Q Okay It's a mixture of oil and some water?
 (20) A Yes It's emulsified - water is emulsified into it It
 (21) probably contains some sediment too
 (22) MR JAMIN All right Your Honor I'd offer the next
 (23) as Plaintiffs 1911-B and ask permission to publish it
 (24) (Exhibit 1911 B offered)
 (25) MR SANDERS May I see that please?

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- (1) MR JAMIN You certainly may
 (2) MR SANDERS I have no objection Your Honor
 (3) THE COURT Plaintiffs Exhibit 1911 B is admitted
 (4) (Exhibit 1911-B received)
 (5) BY MR JAMIN
 (6) Q All right So we've seen a little bit of oil on Knight
 (7) Island and a little bit of oil over in Cape Douglas Let me
 (8) ask you next sir if you can tell me where Windy Bay is on the
 (9) Kenai Peninsula?
 (10) A Yes I think the map is very accurate but it's a very
 (11) large -
 (12) Q Take me up or down the peninsula and tell me when to stop
 (13) A You passed it already
 (14) Q Right there?
 (15) A Yes
 (16) Q Right about there?
 (17) A Yes
 (18) Q And I agree with you it's pretty tough to find Windy Bay
 (19) on that map but I think you've done a good job
 (20) Let me ask you to identify how the geomorphologist
 (21) describes the oil in 1993 that is found at Windy Bay
 (22) A Pit number 1, upper intertidal zone, boulder over bedrock
 (23) HOR
 (24) Q What does the HOR mean?
 (25) A Heavy oil residue

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- (1) Q Is that where pore spaces are partially filled with
 (2) residue but not generally flowing?
 (3) A Yes Windy Bay is one of the few locations on the Kenai
 (4) where you find that condition
 (5) Q This was taken in July of 1993?
 (6) A Yes
 (7) Q Let me substitute the photograph, and in that photograph
 (8) are you able to determine what - what else is on the rocks in
 (9) the background behind the oil?
 (10) A Looks like some barnacles That's what you're referring
 (11) to?
 (12) Q Do you see anything else or you're seeing barnacles there?
 (13) A I'm not sure that I'm seeing a stain but that's hard to
 (14) tell
 (15) Q Let me give you the photograph directly and see if you can
 (16) identify anything else in that picture
 (17) A Oh those are mussels I thought it might be a stain
 (18) Looks like mussels to me
 (19) MR JAMIN Your Honor, I'd ask for permission to
 (20) offer this exhibit as 1911 C
 (21) (Exhibit 1911 C offered)
 (22) MR SANDERS No objection Your Honor
 (23) THE WITNESS This patch here
 (24) MR JAMIN May I publish it Your Honor?
 (25) THE COURT Plaintiff's Exhibit 1911 C is admitted

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- (1) (Exhibit 1911 C received)
 (2) MR JAMIN That's the one from Windy Bay
 (3) MR SANDERS Can we move this map? I can't even see
 (4) the clock from here That's awfully important
 (5) MR JAMIN We'll move the map Is this a good time
 (6) to stop Your Honor?
 (7) THE COURT It's a good time
 (8) MR JAMIN And I'll set up the map later
 (9) THE COURT We'll be in recess for 15 minutes
 (10) (Jury out at 12:00 p.m.)
 (11) (Recess from 12:00 p.m. to 12:17 p.m.)
 (12) (Jury in at 12:17 p.m.)
 (13) MR JAMIN Thank you Your Honor
 (14) BY MR JAMIN
 (15) Q Mr. Jahns I'm just going to be a few more minutes and I'm
 (16) going to explore a couple of other photographs and we'll be
 (17) done Let's look at this fourth photograph from the Exxon
 (18) program in 1993
 (19) Now is this from a location called Perevalnie Pass?
 (20) A I call it Perevalnie Pass
 (21) Q It's -
 (22) A On Shuyak Island
 (23) Q Let's get a sense just for a moment Shuyak Island is the
 (24) uppermost island in the Kodiak Island group?
 (25) A Yes

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- (1) Q And am I getting that in just about the right place?
 (2) A Yes
 (3) Q What is the geomorphologist seeing in this particular
 (4) photograph sir?
 (5) A He's seeing some SOR/H Says close up of SOR surface oil
 (6) residue
 (7) Q And is that defined as significantly oil coated beach
 (8) sediments in the top five centimeters where the sediments do
 (9) not form a cohesive layer?
 (10) A That sounds correct I'm not familiar - I call it surface
 (11) oil residue
 (12) Q And the geomorphologists when they find SOR are
 (13) supposed to
 (14) describe the SOR in terms of either heavy or light, is that not
 (15) true?
 (16) A Yes
 (17) Q And the geomorphologist here has done that and assigned
 (18) the
 (19) term H?
 (20) A Which means heavy
 (21) Q In this one it indicates the - around a boulder at the
 (22) base of the beach face after excavation Does that mean that a
 (23) boulder was turned up sir?
 (24) A It could It's not specific
 (25) Q Let me ask you to look at the photograph It might help
 (26) you answer that question I know these photographs are a lot
 (27) better than the xerox copies

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- (1) A Yes It looks like there was a boulder excavated and there
 (2) was oil underneath I find that very interesting, because it
 (3) agrees with the theory of mine that oil migrates towards the
 (4) surface and gets stuck under an impermeable layer That's why
 (5) we find it under boulders
 (6) Q We might go out on different beaches and turn over boulders
 (7) and see the oil there?
 (8) A Yes
 (9) MR JAMIN Your Honor, I'd like to offer and request
 (10) to publish Plaintiff's Exhibit 1911 D
 (11) (Exhibit 1911-D offered)
 (12) MR SANDERS No objection
 (13) THE COURT Plaintiff's Exhibit 1911-D is admitted
 (14) (Exhibit 1911 D received)
 (15) MR JAMIN I've managed to lose my paper clip here
 (16) but I'll get it together before they go to the exhibit room
 (17) BY MR JAMIN
 (18) Q Let's take a look at the next one, sir, and this one is
 (19) from the same area there on Shuyak Island in the Kodiak Island
 (20) group?
 (21) A Perevalnie Pass yes
 (22) Q Does this one show a close up of mousse on a rock surface?
 (23) A That's what the caption says yes I haven't - I can't
 (24) see it yet
 (25) Q I'm sorry And let me let you take a quick - I'm going to

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- (1) bring this photograph up for you
 (2) Does the geomorphologist say note the dead littoriana
 (3) shell?
 (4) A Yeah Littoriana That s the Latin name yes
 (5) Q What are they sir?
 (6) A Little mollusks that are on snails
 (7) Q Does having the photograph help you at all to describe what
 (8) the geomorphologist saw and you re able to confirm that it s a
 (9) close up of mousse on rock?
 (10) A Yes there is what looks like - now I can agree that may
 (11) be mousse there -
 (12) Q Okay
 (13) A - in to the right of the pencil
 (14) Q Fair enough
 (15) MR JAMIN Like to offer this as 1911-E Your Honor
 (16) (Exhibit 1911 E offered)
 (17) MR SANDERS No objection Your Honor
 (18) THE COURT You said E?
 (19) MR JAMIN I did May I publish it Your Honor?
 (20) THE COURT 1911 E is admitted
 (21) MR JAMIN Thank you
 (22) (Exhibit 1911 E received)
 (23) BY MR JAMIN
 (24) Q All right, Mr Jahns we just have two more I wanted to
 (25) take another one from down in Windy Bay This was taken from

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- (1) (Exhibit 1911 F offered)
 (2) MR SANDERS No objection
 (3) THE COURT 1911-F is admitted
 (4) (Exhibit 1911 F received)
 (5) BY MR JAMIN
 (6) Q And finally sir since you and Mr Sanders talked a little
 (7) bit about Point Helen let me get up one of the photographs
 (8) from the Point Helen pits
 (9) And can you indicate to us what the geomorphologist
 (10) notes - and I m going to give you the photograph if I may
 (11) and you can help explain what the geomorphologist is seeing
 (12) with reference to the photograph and the key?
 (13) A The comment says pit 14 cobble surface armor zero to 5
 (14) centimeter pebbles pebbles this size 5 to 20 centimeter
 (15) granule That s about pea size material
 (16) 20 to 35 cobbles and boulders so below the granules there
 (17) are bigger classes as they re called with granule matrix So
 (18) around them there s a matrix of pea size gravel 35 to 40
 (19) centimeters All these are depths below the surface
 (20) We re now 35 centimeters which is one and a half - little
 (21) over a foot Granules again and then oil is MOR to HOR which
 (22) means the oil showing in that sediment is classified as medium
 (23) oil residue or heavy oil residue in bottom of pit 35 to 40
 (24) centimeter not clean below
 (25) Q So down to about 40 centimeters what does that translate

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- (1) July 4 of 93?
 (2) A Yes
 (3) Q And it s by Mr Reimer?
 (4) A Yes
 (5) Q And does this - and I know that I m not showing you the
 (6) picture but does the geomorphologist note on this mousse and
 (7) sheen in bedrock crevices MITZ on bedrock outcrop?
 (8) A Yes
 (9) Q Can you help to translate that for us?
 (10) A Yes It means that there were - mousse and sheen were
 (11) observed in some crevices little cracks in the bedrock in the
 (12) middle intertidal zone that s what MITZ stands for in a
 (13) larger outcrop of bedrock
 (14) Q I m going to put the photograph on the screen and I m going
 (15) to try to zoom it down so we see the hole and give you the
 (16) photograph and ask if you can describe in addition to the
 (17) petroleum what else you see in that picture
 (18) A Okay I see a crack and around it some sheen and what may
 (19) be actually sheen on water It would have to be sheen on
 (20) water So all the liquid visible there is oil and I see
 (21) plenty of barnacles and some fucus growing very close to the
 (22) crack
 (23) Q All right Let s take a look if I may -
 (24) MR JAMIN Your Honor I d offer that as Plaintiffs
 (25) 1911-F and request permission to publish

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- (1) to in inches?
 (2) A It s one and a third foot so it would be 16 inches
 (3) Q 16 inches they re seeing MOR to HOR?
 (4) A Yes
 (5) Q And then - but they tell us that it s not even clean below
 (6) that?
 (7) A Not clean below
 (8) Q That s just as far -
 (9) A That s correct
 (10) Q So that s as far down as they have dug?
 (11) A Yes Yes That s one of the conditions I made what I
 (12) think is affirm allowance in the estimates We haven t found
 (13) all the oil we haven t penetrated in all places so I added 50
 (14) percent in one particular place to the estimates as you re
 (15) aware
 (16) Q Now Point Helen sir is back in Prince William Sound and
 (17) it s on Knight Island?
 (18) A Yeah Where your little sticker -
 (19) Q We put a couple of stickers on Knight Island?
 (20) A I forgot to check what section that was
 (21) Q Let me show you that again It s Knight 405 A?
 (22) A Okay All right It s Point Helen yeah
 (23) MR JAMIN Your Honor I d offer this as 1911 G
 (24) request that it is published and I am done - I m not quite
 (25) done with Mr Jahns Let me do the 1911 G part and I ll have

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- (1) one more question
- (2) (Exhibit 1911 G offered)
- (3) MR SANDERS No objection, Your Honor
- (4) THE COURT 1911 G is admitted
- (5) (Exhibit 1911 G received)
- (6) BY MR JAMIN
- (7) Q Sir are all the photographs that we ve had a chance to
- (8) look at together both this morning and this afternoon
- (9) photographs that were done by Exxon contractors in the
- (10) summer
- (11) of 1993?
- (12) A They look like they were yes
- (13) MR JAMIN Thank you sir I have nothing further
- (14) Thank you for your patience
- (15) THE COURT Redirect?
- (16) MR SANDERS Your Honor might it wait a second and
- (17) let the publication be completed?
- (18) THE COURT Certainly
- (19) MR SANDERS May I collect the pictures please? May
- (20) I approach, Your Honor?
- (21) REDIRECT EXAMINATION OF HANS JAHNS
- (22) BY MR SANDERS
- (23) Q Dr Jahns let me first go to one of the areas that counsel
- (24) covered earlier where he was reading portions of your
- (25) deposition concerning a phrase that caught my eye denial of
- (26) compensation And let me ask you if you will turn to page 115

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- (1) where he was reading from and the top of page 116
- (2) Let me ask you if right after that those questions that he
- (3) read starting at page 116 at line 11 midway through the
- (4) line the following question was asked - and I ll ask the
- (5) question that was asked of you in the deposition and I want you
- (6) to read the answer
- (7) Sir is it correct to state that from your own experience
- (8) working with the NRDA function of Exxon that you were aware
- (9) that you were assisting Exxon in its attempt to deny
- (10) compensation to people who had claimed to have been
- (11) victimized
- (12) by the Exxon Valdez oil spill and the subsequent contamination
- (13) of the Alaska shoreline with oil from the Exxon Valdez?
- (14) Then there was as you might expect an objection by
- (15) counsel and then this answer - please read
- (16) A Well what bothers me about the question is to deny
- (17) compensation I mean I know it was for litigation support in
- (18) defense against the legal action brought against us I mean
- (19) that s the extent to which I would answer yes We provided
- (20) factual information that would help Exxon to defend against
- (21) legal claims Legal action was brought against us
- (22) Q Thank you sir Now very briefly if you - these are
- (23) little pieces of paper that counsel put on this map and this
- (24) looks like a lot of oil if you look at these little pieces of
- (25) paper
- (26) How much - how much mileage are we covering here with

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- (1) these little pieces of paper? Can you give us an estimate?
- (2) A Very little
- (3) Q I mean, in terms of actual, where this piece of paper is
- (4) that covers the shoreline of a lot of miles doesn t it?
- (5) A Oh, yeah The piece of paper is of course much bigger than
- (6) the oiled shoreline in those areas
- (7) Q I was going to ask you you got these little pieces of
- (8) paper there but how big are those pits there?
- (9) A Pits would be about a square foot These pictures
- (10) typically the close ups cover a square foot
- (11) Q All right Now, you ve got a couple of questions about the
- (12) survey that was done in 1993 and I have a couple of questions
- (13) to ask you in order to clarify this area
- (14) First someone said, and I believe I heard it from counsel
- (15) that 25 percent of the shoreline was oiled initially Now
- (16) isn t it a fact that of roughly 3,000 miles of shoreline only
- (17) 486 miles were initially oiled, is that correct or were oiled?
- (18) A In Prince William Sound oiled to some degree yes
- (19) Q And that is - rather than being 25 percent that s 16
- (20) percent?
- (21) A It s about 16 percent, yes
- (22) Q Now when you were talking about 25 percent of the survey
- (23) that s a totally different concept or scope isn t it?
- (24) A Yes
- (25) Q Because the survey was designed to do what?

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- (1) A To identify remaining traces and evidence of oil
- (2) Q Right And so therefore are you aware of what the
- (3) instructions were to the people doing this 1993 survey?
- (4) A Yes I ve talked with them about that The instructions
- (5) were to find as much as possible of oil that left on those
- (6) shorelines where we had known there was oil in the past and in
- (7) the last few years and other shorelines where claims were
- (8) brought to our attention that there might still be oil
- (9) Q In other words they were looking for oil where it had been
- (10) found in the past or where it had been reported?
- (11) A Yes
- (12) Q And on looking at just those places where it was known to
- (13) be or where it was reported to be the survey found roughly 25
- (14) percent of that area had some oiling condition?
- (15) A Yes Of the 31 miles that were surveyed in Prince William
- (16) Sound 25 percent of that had still oil to some degree and most
- (17) of it was very light oiling which means less than ten percent
- (18) of whatever area had oil on it was actually covered by oil
- (19) Q Now at the time that you were deposed with the exception
- (20) of that one mention that s counsel made to you of being
- (21) deposed
- (22) last night the questions that you were asked - that he asked
- (23) you about in the course of - of his cross examination of you
- (24) at the time of that deposition did you have the 1993 survey
- (25) results?
- (26) A No

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- (1) Q Now I want to go finally to some questions about this
 (2) review process and these papers First let me ask you at
 (3) this ASTM conference that counsel asked you about in fact
 (4) when the conference actually occurred you were there weren't
 (5) you?
 (6) A Yes
 (7) Q And the procedure was that the people who had a paper to
 (8) submit or present or make available whatever word you guys
 (9) use you were actually there in a kind of a little booth area
 (10) weren't you?
 (11) A At one of the conferences yes there was what's called a
 (12) poster session where you showed off what you had done
 (13) Q And people could come up to you and ask you questions
 (14) about
 (15) it?
 (16) A Yes
 (17) Q Anybody could?
 (18) A Yes
 (19) Q As a matter of fact do you happen to recall one person who
 (20) came up and engaged you in conversation during that
 (21) conference?
 (22) A Yes
 (23) Q Did you see him today in the courtroom?
 (24) A Yes
 (25) Q Is it that guy right there?
 (26) A Yes
 (27) Q And did he talk to you about half an hour or so?

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- (1) A I don't know how long it was but yes I remember that
 (2) discussion
 (3) Q And did you tell him what you had found?
 (4) A Of course Probably gave him a paper
 (5) Q Now finally he asked you a lot of questions about your
 (6) papers being reviewed by the corporation and he quickly then
 (7) went to lawyers and public affairs What he didn't ask you is
 (8) what I want to ask you
 (9) Was there ever a time ever a time that any lawyer
 (10) representing Exxon in making these comments he was talking
 (11) about like Mr Redman's comments or Mr Stevens' comments
 (12) were you ever asked to change a fact?
 (13) A No
 (14) Q Were you ever asked to leave out any fact?
 (15) A No
 (16) Q Were you ever asked to change an opinion?
 (17) A No
 (18) Q Were you ever asked to soften up an opinion?
 (19) A No
 (20) Q Were you ever asked to strengthen an opinion?
 (21) A No I was asked to do it just right
 (22) Q Were those instructions made clear to you Dr Jahns?
 (23) A Yes And we made them clear to every one of our authors
 (24) We told them that above all they are to represent the facts
 (25) and present their professional opinions and there was no

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- (1) question about that
 (2) Q Did you ever hear from anybody in your group that worked
 (3) for Exxon that did - or participated in one of these papers
 (4) that they were asked to ever change a fact?
 (5) A No
 (6) Q Were they ever asked to change or modify an opinion?
 (7) A No
 (8) Q And of the people who worked on these papers who did not
 (9) work for Exxon but had been hired by Exxon were they ever
 (10) asked to change a fact?
 (11) A No
 (12) Q Or a conclusion?
 (13) A No
 (14) Q Or to modify it in any way?
 (15) A No
 (16) Q As a matter of fact Dr Jahns doesn't Mr Jamn have the
 (17) process upside down?
 (18) A Yes
 (19) Q Tell the Ladies and Gentlemen of the Jury exactly what this
 (20) process was
 (21) A As I viewed it from my viewpoint the process of having
 (22) the paper reviewed as it's called or circulated or read by
 (23) people that needed to know about it had two purposes One
 (24) was
 (25) to see whether these people could understand what the
 (26) scientists had written They had many comments or
 (27) suggestions

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- (1) for writing it better clarifying better Many of the people
 (2) that read it are better writers than some of the scientists
 (3) that wrote the papers
 (4) And second was these people understood what the facts and
 (5) conclusions were that we were drawing and if they had different
 (6) ideas about these facts and conclusions they had to change
 (7) their ideas about that because the facts couldn't be changed
 (8) and it would be stupid to suggest to do it because we all look
 (9) at the same data There's nothing to hide
 (10) Q As a matter of fact Dr Jahns when you and your
 (11) colleagues the scientists worked on collecting and analyzing
 (12) this data and then worked on publishing this data what was
 (13) your expectation about what kind of review it was going to
 (14) receive in the United States of America outside of Exxon?
 (15) A Well it would get peer review in the scientific community
 (16) and we hoped it would be read as widely as possible
 (17) Q And as a matter of fact didn't you know that if you made a
 (18) single mistake that there were going to be literally hundreds
 (19) of thousands of people looking for that mistake?
 (20) A Yes
 (21) Q And you couldn't afford to make one?
 (22) A That's right, we could not afford to make any mistakes
 (23) MR SANDERS No further questions
 (24) THE COURT Thank you sir You may step down
 (25) MR NEAL Your Honor we call Dr David Page

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- (1) THE CLERK Would you raise your right hand please
 (2) sir
 (3) (The Witness Is Sworn)
 (4) THE CLERK Please be seated For the record sir
 (5) state your full name, your address and spell your last name
 (6) please
 (7) THE WITNESS My name is David Sanborn Page, P A G E
 (8) I live at 29 Magean M A G E A N Street Brunswick Maine
 (9) DIRECT EXAMINATION OF DR DAVID PAGE
 (10) BY MR NEAL
 (11) Q It is Dr Page is it not?
 (12) A Yes it is
 (13) Q How are you employed presently Dr Page?
 (14) A I m a professor of chemistry and biochemistry at Bowdoin
 (15) College in Brunswick Maine I also direct a research group at
 (16) Bowdoin College called the hydrocarbon Research Center that
 (17) deals with environmental matters
 (18) Q How long have you held these positions as professor of
 (19) chemistry and biochemistry at Bowdoin and as director of the
 (20) Hydrocarbon Research Center at Bowdoin?
 (21) A Since 1974
 (22) Q Let me skip a moment and go to ask you the positions or
 (23) teaching positions you have held, if any, prior to 1974?
 (24) A Prior to 1974 I taught for three years at Bates College in
 (25) Lewiston Maine and I had a position as a teaching postdoc at

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- (1) Purdue for a year prior to that
 (2) Q And these were – these two positions prior to your 20
 (3) years at Bowdoin were in what area sir?
 (4) A Those positions were in the area of chemistry and
 (5) biochemistry as well
 (6) Q Now Doctor would you tell us about your formal education?
 (7) A I got my bachelors degree in chemistry from Purdue
 (8) University – Purdue I got any bachelors degree in chemistry
 (9) from Brown University in 1965 Then I went on to Purdue
 (10) University where I got my Ph D in 1970 in chemistry where I
 (11) did my research in the area of biochemistry
 (12) Q All right Now you said your current position is professor
 (13) of chemistry and biochemistry One more time tell us what
 (14) biochemistry is?
 (15) A Biochemistry is the chemistry of living organisms It s
 (16) chemistry as it s applied to understanding life processes
 (17) Q Have you – Doctor, have you published in the area of
 (18) biochemistry?
 (19) A Yes I have
 (20) Q Approximately how many publications in that area?
 (21) A Out of a total of about 60 some odd publications
 (22) approximately half are in the area of biochemistry of one sort
 (23) or another
 (24) Q So about 30 publications in the area of biochemistry?
 (25) A Yes

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- (1) Q Now we have mentioned a term here and I never got
 (2) straightened out on it peer review You want to publish an
 (3) article in your area of expertise and you want it – is peer
 (4) review something you d like to have done?
 (5) A I think peer review is very important because it provides
 (6) the author of any article even a report to a government
 (7) agency with very valuable feedback that helps make it better
 (8) Q Well what does peer review mean? Does that mean your
 (9) equals in your – in your field review it and say this is
 (10) baloney or this is good stuff or right on man or what s the
 (11) purpose of that?
 (12) A Well what it is, it s people who are technically competent
 (13) to evaluate what you re saying and what you ve written that
 (14) give their best effort in doing a critical evaluation of what
 (15) you re trying to say and what your conclusions are and again,
 (16) it s a way to make whatever you ve written better
 (17) Q So they critique your work, your hypotheses your tests of
 (18) your hypotheses your conclusions et cetera is that correct?
 (19) A Yes
 (20) Q If a magazine in your field asked you to submit a scholarly
 (21) paper and to have it peer reviewed and you had it you
 (22) submitted it for peer review and your peers didn t like it,
 (23) what happens to – what happens to that? Do you go ahead and
 (24) accept it or is it up to the publication to the magazine or
 (25) journal?

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- (1) A If the reviewers of an article or report find that there
 (2) are things that need revision or there are things that they
 (3) don t agree with then the editor or the manager who you re
 (4) writing the report to sends it back to you with their comments
 (5) and what you do is you respond to those comments in good
 (6) faith You revise the manuscript and then you send it back
 (7) Q Okay Now how many of these 30 some publications in the
 (8) area of biochemistry have you had submitted through the
 (9) process
 (10) of peer review as you ve described?
 (10) A Well, all of them in one way or another have gone through
 (11) peer review
 (12) Q Now Dr Page, you were asked by Exxon to do some work
 (13) on
 (13) the Exxon Valdez oil spill is that correct?
 (14) A Yes
 (15) Q Before we get to that however have you done work on oil
 (16) spills prior to the Exxon Valdez spill?
 (17) A Yes I have
 (18) Q Over what period of time?
 (19) A I ve been working on oil spill studies their fate and
 (20) effects for the last 20 years in collaboration with a
 (21) colleague at Bowdoin College
 (22) Q Would you identify for the Ladies and Gentlemen of the Jury
 (23) some of the oil spills that you ve worked on?
 (24) A Well, first oil spill I worked on was the Tomano spill
 (25) (ph), which occurred in Casco Bay, Maine right on my
 doorstep,

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- (1) in 1974 Then I went on did a big project with the Amoco
 (2) Cadiz oil spill in Brittany France over a period of a number
 (3) of years and then I've of course worked on the fate and
 (4) effects of the Exxon Valdez oil spill
 (5) In addition to those three I've worked on at least a dozen
 (6) oil spills during the last 20 year period
 (7) Q And you have worked on them to study the fate and effects
 (8) is that correct is that what you mentioned?
 (9) A Yes
 (10) Q Tell us what you mean by the fate and effects of an oil
 (11) spill
 (12) A Well we talk about fate and effects because there's really
 (13) two things you have to think about when you're studying an oil
 (14) spill There's the fate in other words what happens to the
 (15) oil once it reaches the environment because petroleum
 (16) changes
 (17) on exposure to the environment and therefore you know that's
 (18) a chemical problem You have to study the chemical changes
 (19) that take place in the oil over a time as it naturally breaks
 (20) down in the environment
 (21) The fate (sic) side of the equation is what is the oil
 (22) doing to marine plants and animals
 (23) Q You said the fate side -
 (24) A The fate side
 (25) Q Is that the fate side what it's doing to plants and
 (26) animals?

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- (1) A I'm sorry the effect side Thank you Mr Neal The
 (2) effect side of the equation is what effect is all this having
 (3) on marine plants and animals in the spill zone and of course
 (4) the effect side changes because the petroleum changes with
 (5) time and therefore it's a chemical problem the fate side
 (6) and a biological problem the effect side and you really have
 (7) to mesh the two very closely if you are going to understand
 (8) what's really happening at an oil spill site
 (9) Q Now other than this employment for Exxon have you
 (10) worked
 (11) for other members of the oil industry?
 (12) A Yes, I have
 (13) Q Would you tell us, identify some of those for us?
 (14) A Well we've worked with the Mobil Foundation Mobil Oil
 (15) Foundation worked with the Arco Foundation worked with
 (16) Exxon
 (17) Production Research I've worked with the American Petroleum
 (18) Institute over the years
 (19) Q Have you also worked for various governmental agencies or
 (20) entities?
 (21) A Yes I have
 (22) Q Would you give us some of those the governments you've
 (23) worked for?
 (24) A Well first and foremost over the years I've worked very
 (25) closely with the State of Maine in many ways which is my home
 (26) state In addition I've worked with the British government
 (27) and I've work with the U S government

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- (1) Q All right Now Dr Page have you been accepted as an
 (2) expert in chemistry and biochemistry in the United States
 (3) including an expert in the fate and effects of oil spills?
 (4) A Yes I have
 (5) Q Has that been in United States district courts like this
 (6) one?
 (7) A Yes it has
 (8) Q And have you been accepted as an expert in administrative
 (9) proceedings in the United States?
 (10) A Yes I have
 (11) MR NEAL May it please the Court I offer or tender
 (12) Dr Page as an expert in the fields of chemistry and
 (13) biochemistry including therein as an expert in the fate and
 (14) effects of oil spills
 (15) MR O NEILL We have no objection to his
 (16) qualifications and express only a concern that his testimony
 (17) not be cumulative of the last two hours
 (18) MR NEAL Well I'll do my best not to be cumulative
 (19) at all Obviously it touches on that but I'll do my best I
 (20) certainly want to get him out of here as well I'll move on
 (21) THE COURT The witness qualifications are accepted
 (22) BY MR NEAL
 (23) Q Dr Page what - in this case what were you asked by
 (24) Exxon to do?
 (25) A I was asked to study the intertidal shorelines of Prince

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- (1) William Sound and subtidal areas in Prince William Sound to
 (2) determine the remaining effects of the spill on those areas
 (3) Q Now you say shorelines You use shorelines and the
 (4) intertidal areas to mean the same thing?
 (5) A Yes
 (6) Q Okay So the shorelines or intertidal areas and the
 (7) subtidal area is that correct?
 (8) A Yes
 (9) Q And when you say subtidal areas you mean that area that is
 (10) below the water when the water is at low tide?
 (11) A Yes
 (12) Q Now did you have others helping you Dr Page?
 (13) A Yes I did
 (14) Q Would you very briefly identify some of those people who
 (15) helped you in this process and a brief very brief description
 (16) of their expertise?
 (17) A Well over the years since we engaged in many studies
 (18) I've worked with many people but to keep it short first and
 (19) foremost there's my colleague of long standing Dr Ed
 (20) Gilfillan is who is a marine ecologist at Bowdoin College
 (21) then Dr Paul Boehm who is a chemist at Arthur D Little Dr
 (22) Greg Douglas who is a chemist at Batel Ocean Science (ph)
 (23) there's Dr Jerry Neff who is a toxicologist at Batel Ocean
 (24) Science there's Dr Bentz who is an analyst at Exxon
 (25) Production Research

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- (1) And again this is just a few of the many people and groups
 (2) that I've worked with
 (3) Q All right Now I meant to ask you over what period of
 (4) time did your work for Exxon in this case cover?
 (5) A Well, the period of time that I worked with Exxon on this
 (6) was from 1990 to the present time
 (7) Q To as we sit or stand here today?
 (8) A Yes
 (9) Q From '90 to mid '94?
 (10) A Yes
 (11) Q All right Now you were asked by Exxon to determine the
 (12) fate and effects of the oil spill in respect to Prince William
 (13) Sound, is that correct?
 (14) A Yes
 (15) Q How did you go about your work?
 (16) A Well as part of a number of scientific studies that we
 (17) did I visited over 129 locations in Prince William Sound many
 (18) of them more than once
 (19) Q Let me stop you right there At my request, did you
 (20) prepare a map reflecting the areas you visited in Prince
 (21) William Sound as a part of your work?
 (22) A Yes, I did
 (23) Q I show you Defendants Exhibit 8986 - it was admitted in
 (24) evidence this morning I believe - and ask you what that
 (25) reflects? We'll hold it here for you We'll use this only one

4c 5

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- (1) time
 (2) A Okay what that shows is the little dayglow dots simply
 (3) represent all of the shoreline locations that I visited at
 (4) least once in Prince William Sound I'm sorry that the poster
 (5) is so floppy If you look some of the sites that I visited
 (6) were so close together that it appears like I did a lot of
 (7) diving in the middle of Prince William Sound but in fact that
 (8) just represents a lot of closely spaced locations on the north
 (9) end of LaTouche Island
 (10) Q So each spot here represents a site you visited?
 (11) A Yes
 (12) Q At least once?
 (13) A Yes
 (14) Q And these that look like they're out in the water or out in
 (15) the water there on the chart are simply because they'd just be
 (16) on top of each other if you put them on LaTouche Island okay
 (17) is that correct?
 (18) A Yes
 (19) Q Now we know from everybody that's told us that here we had
 (20) a - here we had a grounding and the oil spill without trying
 (21) to be precise at all came in the direction of your dots
 (22) correct?
 (23) A Yes
 (24) Q But I do notice that you have a dot up here that's -
 (25) Judge I hope I'm right Tatitlek Tatitlek?

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- (1) THE COURT Probably
 (2) MR NEAL Go ahead and say it out loud
 (3) MR SELNA Tatitlek
 (4) MR NEAL Okay, I can't see it and I can't pronounce
 (5) it
 (6) BY MR NEAL
 (7) Q Why did you go up there?
 (8) A Well that was a beach near the village of Tatitlek that
 (9) Mr Bush had visited in 1994 We had some pictures of rocks
 (10) from that beach that had tar spots on them and we wanted to go
 (11) back and visit the same place that he visited and see what that
 (12) beach was really like
 (13) Q Okay let me put this away now Now you visited these 129
 (14) sites in Prince William Sound you said at least once I guess
 (15) some you visited more than once?
 (16) A Yes
 (17) Q And this is a period from 1990 to 1994 correct?
 (18) A Yes
 (19) Q All right Go ahead and tell us what you did, then,
 (20) carrying out your work just your processes
 (21) A Well, the studies that we did really fall into two phases
 (22) In 1990 and 1991, we did a very extensive and rigorous
 (23) scientific study of the shorelines of Prince William Sound and
 (24) what that involved was visiting 64 randomly chosen shoreline
 (25) locations in Prince William Sound Of these 64 48 of these

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- (1) shoreline areas had been oiled and 16 had never gotten any
 (2) oil And the reason you visit unoiled locations is so that you
 (3) can understand what oiled locations should look like when
 (4) they've recovered
 (5) The shorelines that we visited in this random site study
 (6) were selected with the aid of a computer data base that had the
 (7) shoreline of the Sound in it and we were able to select sites
 (8) over a range of oiling levels and range of shoreline types
 (9) again, in a random unbiased manner
 (10) In addition to this random study -
 (11) Q Hold on just a minute You said a variety - you selected
 (12) them for a variety of oiling That means heavy moderate,
 (13) light?
 (14) A Yes
 (15) Q And you said you selected them to cover the nature
 (16) reflecting the shoreline of Prince William Sound?
 (17) A Yes
 (18) Q You mean we've heard bedrock boulder cobble and those
 (19) kind of areas that exist in Prince William Sound?
 (20) A Yes
 (21) Q So you wanted to cover them all?
 (22) A We wanted to do as comprehensive a job as possible
 (23) Q All right Now you've talked about 64 sites and you
 (24) started to say something else?
 (25) A Well at the same time we were doing that study in 1991, we

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- (1) also felt it was important not to miss studying heavily oiled
 (2) locations So we had in addition to these 64 locations 11
 (3) worst case places that were heavily oiled and that we've all
 (4) heard about here and we studied those sampled them in 1990
 (5) and 1991, and what we did at all of these sites that I just
 (6) described is that the sampling teams would go out take
 (7) samples biological samples from many places on the beaches
 (8) take samples of sediment take samples of water take samples
 (9) for testing the toxicity of the sediment to marine life These
 (10) samples we took back to the laboratory We analyzed them in
 (11) many different laboratories We reviewed the results We
 (12) analyzed the results in order to determine what remaining
 (13) effect the spill had on the shorelines in 1990 and 1991
 (14) Now that was sort of the first phase now
 (15) Q That's stage one?
 (16) A Right
 (17) Q What about stage two did you do anything else?
 (18) A Well in stage two in the second phase beginning in 1992
 (19) our effort was more directed toward shoreline surveys and
 (20) shorelines that we surveyed in 1992 1993 and this year
 (21) included the 11 worst case places that we had started to visit
 (22) in 1990 and in addition we visited many of the places that
 (23) Dr - or Mr Bush surveyed as part of his studies again to
 (24) broaden our understanding of what was going on in the Sound
 (25) And at all of those sites that we surveyed it was our practice

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- (1) to get there at low tide so we could look at the whole beach
 (2) not just the top part of it and really do a thorough job
 (3) digging pits in the beach and examining it as carefully as we
 (4) could
 (5) Q All right Now you've talked about the intertidal areas
 (6) What did you do with respect to the subtidal areas? You said
 (7) you were asked to look at both in your work
 (8) A Yes In 1990 and 1991 we did an extensive subtidal
 (9) sampling involving the collection of over 2400 sediment
 (10) samples
 (11) from subtidal areas in Prince William Sound and in the Gulf of
 (12) Alaska These samples came from locations near heavily or
 (13) near
 (14) shorelines of all sorts in water as shallow as six feet and
 (15) some of the samples we took in the middle of the Sound in very
 (16) deep waters off in the Gulf of Alaska
 (17) We again had the sediment samples sent off to be analyzed
 (18) for hydrocarbons We also had some of the - many of those
 (19) subtidal sediment samples tested to see whether they were
 (20) toxic
 (21) to marine animals and it turns out that we didn't do subtidal
 (22) studies after 1991
 (23) Q Let me - let me take the admonition of my friend Mr
 (24) O'Neill here and try not to be too repetitive Let me do as
 (25) they say in Hollywood let's cut to the chase You know what
 (26) that means?
 (27) A Yes
 (28) Q What does that mean?

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- (1) A It means get to the bottom line and summarize what we're
 (2) trying to say
 (3) Q Doesn't that mean in the old cowboy movies that some of us
 (4) used to see on Saturday afternoon at the movie if you cut to
 (5) the chase you end up with a huge chase where the good guys
 (6) are
 (7) chasing the bad guys or the bad guys are chasing the stage
 (8) coach and all that well let's cut to the chase in this case
 (9) and ask you this based on your work and using your
 (10) knowledge
 (11) and your experience have you reached any opinions as to the
 (12) remaining effects as we sit here today the remaining effects
 (13) of the spill on the shoreline or intertidal areas of Prince
 (14) William Sound?
 (15) A Yes I have
 (16) Q What is that opinion or opinions?
 (17) A As we sit here today in 1994 the shorelines of Prince
 (18) William Sound have largely recovered from the spill
 (19) Q Do you have any opinion as to whether the spill as we -
 (20) as we sit here today has any remaining effect on the plant and
 (21) animal life - or I'll use this new word I've learned learned
 (22) from Mr Sanders biota - biota in Prince William Sound?
 (23) A Yes I do
 (24) Q What is that opinion?
 (25) A Again my opinion is that whatever remaining traces of oil
 (26) that exist in Prince William Sound on the shorelines even in
 (27) beaches that had been heavily oiled are in a form and are in

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- (1) places where they're not available to biota marine plants and
 (2) animals and therefore aren't exerting any remaining adverse
 (3) effect
 (4) Q When you say not available is that another term called
 (5) bioavailability?
 (6) A Yes
 (7) Q Now That's as to the intertidal areas or the shorelines
 (8) that we've discussed What about the - what about have you
 (9) reached any opinion based on all the above about the
 (10) remaining
 (11) effects of the spill on the subtidal areas of Prince William
 (12) Sound?
 (13) A Yes, I have
 (14) Q And what is that opinion?
 (15) A Well, by 1991 our study showed that first of all very
 (16) little oil that could be attributed to the spill got down into
 (17) the sea floor of Prince William Sound even in nearshore
 (18) subtidal areas in shallow water Our toxicity studies testing
 (19) sediment samples with animals showed that what residues
 (20) were
 (21) present in some nearshore subtidal locations didn't pose a
 (22) widespread threat to biota in 1991
 (23) Now we're 1994 two years - three years later and
 (24) therefore I say that there is no longer any adverse effect
 (25) whatever it might have been to subtidal biota attributable to
 (26) the spill as of today
 (27) Q Now Doctor, to make it clear what you're talking about is

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- (1) the way the Sound is today? You're not discussing or denying
 (2) the fact that the spill had damage and all of that? You're
 (3) talking about the Sound as it is today in your opinion?
 (4) A That's right. Nobody in this room would deny that there
 (5) was damage in '89.
 (6) Q Now then, let me change and move on quickly. Mr. Bush
 (7) testified in this case regarding certain areas of Prince
 (8) William Sound, some ten areas, six of which he shows as
 heavily
 (9) oiled areas in Prince William Sound. Have you read his
 (10) deposition and testimony in this case?
 (11) A Yes, I have.
 (12) Q All right. Six of these sites were heavily oiled. Have
 (13) you been to these nine or ten sites?
 (14) A I've been to eight of the ten sites.
 (15) Q And when did you go to eight of those ten sites?
 (16) A Well, I went to them in 1993 and then I returned to them in
 (17) 1994.
 (18) Q Have you been to eight of those ten sites as recently as
 (19) 1994?
 (20) A Yes, I have.
 (21) Q Have you been to them as recently as this month?
 (22) A I was at some of the sites as recently as June 22nd, 1994.
 (23) Q All right. Why did you only go to eight of them?
 (24) A The reason we only went to eight of them was that two of
 (25) the sites, one at east Chenega Island and another site on east,

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- (1) LaTouche Island, the survey parties working with Mr. Bush
 (2) reported them to be virtually oil free by 1994, and therefore,
 (3) we felt no compelling reason to visit them.
 (4) Q All right. Now let's take them, let's start with six of
 (5) the most heavily oiled sites in Prince William Sound and let's
 (6) start with Point Helen first. Do you have -- and Point Helen's
 (7) on Knight Island, am I correct about that?
 (8) A Yes.
 (9) Q I'm beginning to learn something about the Sound. Do you
 (10) have a picture taken of Point Helen immediately after the spill
 (11) in 1989?
 (12) A Yes, I do.
 (13) Q I show you what is now in evidence as Defense Exhibit 1095
 (14) and ask -- and ask if you recognize that? Can the Members of
 (15) the Jury see this? Can you see that now? What is 1095?
 (16) A 1095 is a view of the east shore of the southern tip of
 (17) Knight Island known as Point Helen.
 (18) Q And this is the way it looked immediately after the
 (19) spill --
 (20) A Yes.
 (21) Q -- in '89, all right. Let's put that right over here now
 (22) and ask you, I believe you said you visited Point Helen
 (23) recently, this year?
 (24) A Yes.
 (25) Q Did you have pictures taken of Point Helen when you visited

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- (1) this year?
 (2) A Yes.
 (3) Q Let me show you first Defense Exhibit 8941, which has been
 (4) admitted in evidence, and ask if you will tell the Members of
 (5) the Jury what this reflects? Everybody see that? Okay, what
 (6) is -- what is shown on Defense Exhibit 8941?
 (7) A What is shown is the southern tip of Knight Island showing
 (8) the entire area of Point Helen.
 (9) Q All right. At my request, did you have another picture
 (10) made that is a blown up portion of a portion -- or of Defense
 (11) Exhibit 8941?
 (12) A Yes.
 (13) Q I show you what is in evidence as Defense Exhibit 8940 and
 (14) ask if you recognize that?
 (15) A Yes, I do.
 (16) Q Could you -- could you -- may the witness come down. Your
 (17) Honor? If we can't see this, we'll do something else. We'll
 (18) get it somewhere. If anybody can't see that, let me know.
 (19) Would you --
 (20) A Could we move the things forward?
 (21) Q Doctor, would you tell the Ladies and Gentlemen of the Jury
 (22) now or explain or point out, point out on 8941 the portion
 (23) that's shown in 8940.
 (24) A Can everybody see this? Okay, if you look at this large
 (25) scale view, see this -- these rocks here and this beacon here

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- (1) and these rocks here and these rocks here and this beach here
 (2) and now we'll look over here and you can see here's the
 (3) beacon, here's those left hand rocks, here's the right hand
 (4) rocks and here's this sort of catcher's mitt shape bedrock
 (5) outcrop right down there. So this is a blowup of that beach
 (6) right there.
 (7) Q Let me do one more thing, and we probably won't have this
 (8) many pictures with the next one, let me show you Defense
 (9) Exhibit 1091 (sic) and let me ask you to point out on both
 (10) 8941 and 8940 the area that's reflected in Defense Exhibit
 (11) 1091 (sic) which is this oiled beach, a picture of the oiled
 (12) beach immediately after the spill. Now show the Members of
 (13) the Jury as of 1994 this area on those two maps.
 (14) A What you're seeing in that picture is the beacon here in
 (15) the sort of upper middle of the picture. You're seeing this
 (16) rock in the left hand side of the picture on the beach, that's
 (17) this rock here, and so the view is across the surface of this
 (18) beach here. So this is -- you're looking south.
 (19) Q Okay.
 (20) A And you wish me to identify on this also?
 (21) Q Sure, go ahead and do it on here, too.
 (22) A Again, here's the beacon, here's the beacon here. This
 (23) rock here is this rock right here. Doesn't show up as well on
 (24) this picture. And we're looking across this beach in this
 (25) direction here.

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- (1) Q Okay Now let s take this away Thank you gentlemen
 (2) Let s go forward here then
 (3) Doctor did you conduct a detailed investigation of Point
 (4) Helen on Knight Island?
 (5) A Yes I did
 (6) Q Would you tell the Ladies and Gentlemen of the Jury what
 (7) you found?
 (8) A Well the picture says it all When you look at this
 (9) picture what we found was basically a very clean good looking
 (10) site And again this picture says it all We found a very
 (11) clean looking site
 (12) Q What did you find in the way of plant and animal life?
 (13) A Well we found a lot of plant and animal life If you look
 (14) along the shoreline here you see all this dark colored stuff
 (15) What that is because this is at low tide is a very dense
 (16) cover of fucus seaweed kelp In fact it makes it hard to
 (17) get out of the boat to walk through this stuff
 (18) In addition if you dig around in the beach lift the
 (19) stones aside in the middle and lower intertidal zone again
 (20) you find all kinds of critters living in that beach
 (21) Q All right Now let me - let me show you something along
 (22) I m pointing to the far right edge in the water of Defense
 (23) Exhibit 8941 What is that? Is that oil?
 (24) A You often see in any body of water - in fact you can see
 (25) it in Cook Inlet walking along the little path these wind and

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- (1) current patterns that just appear on the water surface And so
 (2) this isn t oil streaming off the beach It s just a natural
 (3) wind and current pattern
 (4) Q Doctor did you find oil -
 (5) A Yes I did
 (6) Q - on or in Point Helen?
 (7) A Yes I did
 (8) Q Where did you find the oil and how did you find it?
 (9) A Well let s first go to the large scale map and I ll say
 (10) that we surveyed this beach very intensively
 (11) Q Because that s what they ve seen as heavily oiled?
 (12) A That s right and we also surveyed this area by this rock
 (13) sticking out on the beach in 1994 Now I ll also say that
 (14) right here sort of in the V of this groove here is the area
 (15) that Mr Bush surveyed and visited And what we did was we
 (16) surveyed the upper part Perhaps I ll go to this map here
 (17) because - or this view it shows it better Where you see all
 (18) of these large logs that have been thrown up by the action of
 (19) the waves and in here if you walk along you can find at
 (20) intervals rocks with a little bit of surface coat on them
 (21) Q Coat of oil?
 (22) A It s the exception not the rule
 (23) Q Okay
 (24) A Okay So there s a little bit of surface stuff up here
 (25) but it s like a coating on a rock and it s abraded It s

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- (1) almost worn away If you look upon the line here that s made
 (2) by the seaweed from the high tide we dug a line of pits here
 (3) here here and here and we also dug one down here looking
 for
 (4) subsurface oil and what you find is that there is subsurface
 (5) oil at this place but it s localized behind this bedrock
 (6) outcrop and it s in an area about 10 by a hundred meters in
 (7) here and because -
 (8) Q Ten by a hundred meters?
 (9) A Ten by a hundred meters which is roughly the area that I m
 (10) tracing with my finger here and pits dug around here had no
 (11) subsurface oil Pits dug around here had no subsurface oil
 (12) Pits dug right in here had subsurface oil and you d expect to
 (13) find it there and the reason you expect to find it is that
 (14) this bedrock outcrop here protects this little area of the
 (15) beach from wave action and what that means is that whatever s
 (16) down there is just being worked out at a slower rate than the
 (17) stuff here and here which is long gone
 (18) And if you look at the overall view of Point Helen you can
 (19) see that this feature of the beach that s caused this condition
 (20) to exist isn t duplicated anywhere on the - you know several
 (21) miles of shoreline here And in fact when we surveyed it up
 (22) here we found little - very little subsurface oil We found
 (23) just a little bit of oil sheen in an area right here by this
 (24) rock
 (25) Q You re pointing now to 89 - Defense Exhibit 8941?

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- (1) A That s right
 (2) Q Far right side on the beach?
 (3) A That s correct So it s fair to say that along this whole
 (4) stretch of beach it s pretty well - subsurface oil is pretty
 (5) well gone because it s exposed but it s protected here so it
 (6) takes a little longer to go away
 (7) Q All right Now we ll leave this now and ask you this you
 (8) have said that you found some traces of surface oil on rocks
 (9) and some small portions of subsurface oil on Point Helen one
 (10) of these heavily oiled areas correct?
 (11) A Yes
 (12) Q Do you have an opinion whether the oil remaining residue
 (13) of oil that you had found do you have any opinion whether that
 (14) oil has any remaining affect on the plant and animal life in
 (15) that area?
 (16) A Yes I do
 (17) Q What is that?
 (18) A As this picture shows whatever remaining oil present in
 (19) this site, oil residues it s in a form and in a location
 (20) that s not available to the marine life along this coast and
 (21) therefore there s no remaining adverse effect to plants and
 (22) animals out here
 (23) Q Again we re talking about as of today is that correct?
 (24) A As of 1994
 (25) Q Now let s take another one of those six heavily oiled

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- (1) sites Sleepy Bay, did you visit Sleepy Bay in 1994?
 (2) A Yes I did
 (3) Q By the way Doctor do you have a picture of Sleepy Bay immediately after the spill?
 (4) A Yes I do
 (5) Q I show you what has been marked or is in evidence now as Defense Exhibit 1441 and ask if you recognize that?
 (6) A Yes I do
 (7) Q What is that?
 (8) A It represents a portion of the shoreline in Sleepy Bay as of 1991 (sic), and as you can see this shoreline was heavily oiled Here s the black oiling up here And the lower intertidal zone isn t as heavily oiled, therefore it appears light
 (9) Q All right Now, when you visited Sleepy Bay in 1994, this year did you have a picture made of Sleepy Bay?
 (10) A Yes I did
 (11) Q I show you what has been marked as Defense Exhibit 8936 and ask if you recognize - if you recognize this?
 (12) A Yes I do
 (13) Q What is this?
 (14) A Can everybody see this all right or should we put it on the podium?
 (15) Q Why don t we put it up here You hold that and I ll do this Okay

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- (1) A There Is that all right?
 (2) Q Okay Now this is a picture that you took or had taken of Sleepy Bay the same area over there is that correct in 1994?
 (3) A Yes
 (4) Q Now again, would you tell us what area - would you identify on this exhibit 8936 the area of oiling there that you see on the previous exhibit?
 (5) A Okay I d like you to kind of key in on this outcrop of rocks here that s exposed at low tide with all the seaweed and mussels on it And that outcrop is shown here as sort of this thing sticking out and so what we re doing at Sleepy Bay is we are standing roughly here and we re looking out across this whole area here and so that the beach in the foreground shown there is this part here and then we re going around the point
 (6) Q Doctor this picture over here as I understand it then Defense Exhibit 1441 is a picture of Sleepy Bay immediately after the oil spill in 1989?
 (7) A Yes
 (8) Q I think you may have misspoke yourself
 (9) A I m sorry This is a 1989 picture
 (10) Q And this one is a 1994 picture?
 (11) A And that is a 1994 picture
 (12) Q All right Did you investigate in some detail then other than taking this picture did you investigate in some detail Sleepy Bay, which is again one of these six heavily oiled

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- (1) sites?
 (2) A Yes I did
 (3) Q And what did you find?
 (4) A Well again, like Point Helen what I found was that this is a basically very clean very good appearing site This picture accurately represents what this site is like in 1994
 (5) Q Did you find it - did you dig around whatever you could do did you find any oil?
 (6) A Yes I did
 (7) Q Where did you find the oil?
 (8) A Well this ll take some time because Sleepy Bay s a big place
 (9) Q Just generally because we want to move on try to point out where you found the oil, how you went about finding the oil
 (10) A Our survey started in this location here on the eastern side of Sleepy Bay surveying this area carefully and then moving on to the salmon stream by the sailboat here and then I walked this entire shoreline and surveyed it all the way out to the tip of the point
 (11) Now there are only a few places left in Sleepy Bay where there s significant quantities of remaining oil residues and I ll point them out to you The area around the salmon stream is clean You find no oil residues around the salmon stream
 (12) This area here has some oil residues amongst the rocks and

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- (1) boulders in the upper part of the beach
 (2) In addition we found an area of tar about the size of a card table right around here Some of these rocks up in through this area which was very hard hit have some of that coat with spruce needles adhering to it in the back but they re eroding and going away
 (3) All throughout here I didn t see any oil residues at all until I got to this place right here which again has a deposit of oil residues amongst the rocks at the top of the beach
 (4) This is an area of boulders that don't get worked over very much
 (5) Through here there s some patches of you know like asphaltic material sort of driveway type stuff and we dug a line of pits down this beach and found some oil residue near the top of the beach in one of the pits here and another little patch of sheen down here but in general there s no surface oil residue up here except for this asphaltic material
 (6) Finally, I found a few spots of asphalt in and amongst the rocks at the top of this - but at this whole area here in the lower intertidal zone where all the critters and plants are was oil free
 (7) Q Do you have any opinion as to whether the residue of oil there has any effect on the plant and animal life?
 (8) A No The oil residue is in a place and in a form that it s not causing a problem for the rich plant and animal life that

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- (1) you see down in the intertidal zone
 (2) Q Doctor another area of the six heavily oiled sites the
 (3) Bay of Isles did you visit the Bay of Isles in 1994?
 (4) A Yes I did
 (5) Q And do you have a picture of the Bay of Isles taken this
 (6) year?
 (7) A Yes
 (8) Q And again this is another one of the heavily oiled sites
 (9) is that correct?
 (10) A Yes
 (11) Q And I m showing you and the jury Defense Exhibit 39 –
 (12) 8942 and ask if you could tell us what that is?
 (13) A This is an aerial view looking right down the mouth of the
 (14) Bay of Isles The Bay of Isles is probably one of the
 (15) prettiest places in Prince William Sound You can also see the
 (16) wind and current patterns on the surface of the Bay of Isles
 (17) here and what we re looking at in this aerial is we re drawing
 (18) a bead on the site right here that Mr Bush surveyed in 1994
 (19) and earlier years
 (20) Q Is that the marsh that he mentioned?
 (21) A Well it s really a little cove, but they call it a marsh
 (22) Q I show you what is in evidence as – can you read it?
 (23) A This is Exhibit 8943
 (24) Q 8943 and ask you what that reflects
 (25) A This is an eagle s eye view of this area known as the

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- (1) quote unquote Bay of Isles marsh looking at it from above and
 (2) to locate it again it s right here on this overall view of the
 (3) Bay of Isles
 (4) Q And this is the spot that Mr Bush investigated and
 (5) discussed here?
 (6) A Yes
 (7) Q Now did you investigate this entire area, including the
 (8) little spot that Mr Bush talked about?
 (9) A Yes I ve – I spent a lot of time in the Bay of Isles
 (10) over the years and I ve spent a lot of time studying that area
 (11) that Mr Bush talked about
 (12) Q And what did you find in your investigation?
 (13) A Well I found that the Bay of Isles, as a whole, is a
 (14) clean beautiful healthy environment and even in this worst
 (15) case place when you look at this eagle s eye view, you can see
 (16) fucus growing there It s a clean appearing site until you
 (17) start looking at it close up
 (18) Q All right Look at it close up and tell us what you
 (19) found
 (20) A Okay Well, in 1994 we surveyed this place with a
 (21) fine toothed comb and dug pits on this area here this little
 (22) mound and found oil residue in only one of six pits that we
 (23) dug
 (24) This area here this marsh or cove has a stream running
 (25) through it here, which runs seasonally and what you see here

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- (1) this green area is actually fucus seaweed and we were
 (2) surprised to see that because when I was there in 1991 it
 (3) wasn t there So this is a sign that even this place –
 (4) Q Even this bad place he talked about?
 (5) A Even this bad place is really on the road to recovery And
 (6) when you walk in the middle here around the stream in 1991
 (7) we had oil in our footprints come up By 1994 you didn t have
 (8) that and what you really have now it s like a bathtub ring
 (9) You have sort of deposits of weathered oil and tarry material
 (10) around the edges which again are breaking down by natural
 (11) processes and going away
 (12) We also found some oil residue in this Rocky Point here at
 (13) the mouth of the cove and some pits that we dug Again it
 (14) appears clean and you don t see anything until you dig down
 (15) well below the surface
 (16) And finally in surveying this beach I found one little
 (17) patch of asphaltic material that looked just like dirt until I
 (18) took a second look and it s again asphaltic material on its
 (19) last legs
 (20) Q Doctor I ll ask you the same thing that I ve asked you
 (21) before You found some residue of oil on this badly oiled
 (22) spot Do you have an opinion as to whether this remaining oil
 (23) has any remaining effect as we stand here today or sit here
 (24) today on the plant and animal life in this area?
 (25) A Yes I do have an opinion

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- (1) Q What is that opinion?
 (2) A My opinion is is that again outside of certain places
 (3) within this very small area this place here is having no
 (4) overall effect on the plants and animals in the Bay of Isles
 (5) This is just a very little hot spot and even inside here the
 (6) return of biota in this area indicates that whatever s left
 (7) there is having a minimal effect if any
 (8) Q All right Thank you sir
 (9) Another place that s mentioned by Mr Bush one of the
 (10) other six heavily oiled places was north Chenega Now I
 (11) think you apologized to me you don t have a picture of north
 (12) Chenega taken immediately after the spill is that correct?
 (13) A That s correct
 (14) Q However did you visit north Chenega in 1994?
 (15) A Yes I did
 (16) Q And did you investigate the area?
 (17) A Yes I did
 (18) Q Did you find any oil whatsoever?
 (19) A Yes, I did
 (20) Q Where – tell us where you found it – first tell us what s
 (21) the general overall situation with north Chenega
 (22) A Again until 1989, this was a heavily oiled site This
 (23) shoreline was coated with oil This picture clearly
 (24) represents fairly represents the condition of the north
 (25) Chenega site today There is no oil residues visible in this

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- (1) picture There is a very clean - in fact it's a very pretty
 (2) place to visit
 (3) Q Did you dig down or what did you do? You said you found
 (4) some oil Tell us what you did to find it and where it was
 (5) A Okay Well again we surveyed this place very
 (6) intensively What we did is starting at the mouth where you
 (7) can see these rocks have a very dense dark green coat of fucus
 (8) along here, seaweed there's darker appearing rocks at the top
 (9) is lichen which is normal for rocks throughout Prince William
 (10) Sound
 (11) Q Lichen is a little animal L I C H E N?
 (12) A Lichen is really a plant and animal living together You
 (13) see this dark bathtub type ring at the top of rocks in marine
 (14) areas that's lichen When you survey this site what you
 (15) find -
 (16) Q Go ahead Can you do it from over there?
 (17) JUROR NUMBER ONE Better go over there
 (18) MR NEAL Yeah come over here
 (19) THE WITNESS What you do when you survey this site
 (20) this is the area that Mr Bush surveyed It's - his study
 (21) site was right in the head of this cove and as you walk down
 (22) the line that he used for his study site you find that the top
 (23) of the beach because the gravel moves around that there
 (24) aren't many critters living there But as you get down you
 (25) find that there's snails mussels fucus That's a very rich

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- (1) place And then this dark looking stuff in this little lagoon
 (2) is actually a very dense bed of eelgrass and it's very pretty
 (3) to see
 (4) As you go around here there's - this dark colored part of
 (5) the beach here is actually a very dense mussel bed which we
 (6) also investigated and then very dense cover of seaweed As
 (7) far as oil what we found after a survey is right up in here in
 (8) these rocks there's a little coat eroding away of your
 (9) characteristic spruce needles and sort of I guess you'd call
 (10) it almost asphalt paint It's on its last legs
 (11) In throughout this beach here in very isolated places
 (12) scattered you find what I call eroding asphalt pavement
 (13) little patches maybe the size of your hand or less that look
 (14) like dirt and you can actually crumble them in your hand
 (15) because they're biodegraded patches of asphalt And the only
 (16) place in this whole area that you find subsurface oil in the
 (17) site visited by Mr Bush is right over here There's a little
 (18) spot right in these rocks where you dig down five inches or so
 (19) you can find some oily residue and that's all that's left from
 (20) 1989
 (21) And finally, to be as complete as possible, we went around
 (22) the corner here to this little pocket beach here and this is a
 (23) little gravel bar and we dug around in here and found again
 (24) a little bit of oily material buried under about five or six
 (25) inches of beach material in a short line on the upper

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- (1) intertidal zone but that was it
 (2) BY MR NEAL
 (3) Q Let me ask you the same question even though it gets a
 (4) little bit repetitive You found some slight residue of oil on
 (5) north Chenega one of the heavily oiled areas Do you have an
 (6) opinion as to whether that remaining oil has any remaining
 (7) effect as we speak here today on the plant and animal life in
 (8) that area?
 (9) A Yes I do
 (10) Q What is that opinion?
 (11) A Well again the remaining oil is simply not in a place or
 (12) in a form that's available to plants and animals and
 (13) therefore as the picture shows it's not exerting any
 (14) remaining effect on the plants and animals
 (15) Q Now Mr Bush also mentioned Squirrel Island Did you go
 (16) to Squirrel Island in 1994?
 (17) A Yes I did
 (18) Q And this was another heavily oiled site in 1989 is that
 (19) correct?
 (20) A Yes
 (21) Q I show you what is in evidence as Defense Exhibit 8925 and
 (22) ask you to explain come over here explain to the Ladies and
 (23) Gentlemen of the Jury what they're seeing now
 (24) A This is Squirrel Island It's on the west coast of Knight
 (25) Island and this beach was in fact heavily oiled And what

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- (1) you're seeing is the site investigated by Mr Bush and his
 (2) workers in 1994 and earlier years
 (3) Q Tell us what we're seeing here What is this in here and
 (4) here and around there?
 (5) A Okay Well what you're seeing here is this dark green
 (6) stuff here and in fact the picture's sufficiently detailed
 (7) that you can see this is a very dense coating of fucus all
 (8) around these rocks in the intertidal zone In fact these dark
 (9) areas here, here and here, are a very dense coating of mussels
 (10) you know growing on the rocks as well
 (11) You don't see seaweed of any kind growing in this part of
 (12) the beach here or over here because the rocks that form the
 (13) beach are smaller and they move around in the waves and it
 (14) really - if you're a bit of seaweed growing on the rock like
 (15) that you have a very short lifetime because you get -
 (16) Q That has nothing - the barrenness here has nothing to do
 (17) with the oil spill is what you're saying?
 (18) A It's simply a function of the type of the beach
 (19) Now other things here's this band of lichen that I
 (20) mentioned earlier that's common throughout beaches like this
 (21) And here we have at the top of the beach, again logs and other
 (22) debris kind of moved up by the storm or by storms in general
 (23) Q Did you find any oil in this area?
 (24) A Yes I did
 (25) Q Where did you find it and how did you find it?

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- (1) A Well again we arrived at this site at a low point in the
 (2) tide so that we could survey the entire beach What we did is
 (3) we dug a total of 11 pits throughout this We dug a line of
 (4) pits across the top of the beach where asphaltic material had
 (5) been reported to be buried and we dug a line of pits down the
 (6) line that Mr Bush used to guide his studies of this beach and
 (7) that sort of runs down here
 (8) There were really only two places where you find - well
 (9) three really where you find petroleum residues at this site
 (10) There s a little area right here in this upper corner
 (11) underneath the beach material where you can find some buried
 (12) asphaltic material All throughout here we couldn t find
 (13) anything We dug - we dug around a lot
 (14) When you dig down in this area here you find some holes
 (15) that have some sheen some traces of oil coming into them but
 (16) you don t see any sheening on this beach or any evidence of oil
 (17) when you walk on it without digging holes
 (18) Finally we surveyed this area very carefully and what we
 (19) found was surface coat surface patches of a tarry material
 (20) that weren t related to the spill but were from another
 (21) source
 (22) Q From another source?
 (23) A Yes
 (24) Q Not Exxon oil?
 (25) A Yes

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- (1) Q Now again would you say then that this is a - this
 (2) beach like the others we ve gone over have substantially
 (3) recovered from the spill as we speak?
 (4) A The picture says it all
 (5) Q Do you - we have one more here now then of the - what
 (6) do we have left here of the six oiled north LaTouche Your
 (7) opinion sir on the last one the remaining oil would it have
 (8) any remaining effect on plant and animal life in that area?
 (9) A No Again, whatever s remaining in the site is in a
 (10) location and is in a form that it s simply not available to do
 (11) any remaining harm to plants and animals living there
 (12) Q I m going to put one more up and that s all the last of
 (13) the six remaining oils Did you visit north LaTouche Island in
 (14) 1994 and did you have this picture made?
 (15) A Yes
 (16) Q Let me - is that what the jury is seeing now?
 (17) A Yes
 (18) Q Did you investigate this?
 (19) A Yes
 (20) Q What did you find?
 (21) A Again I found that this site which was very heavily
 (22) oiled, this whole northern shore of LaTouche Island which was
 (23) very heavily oiled in 89 looked really good in 1994 The
 (24) picture says all
 (25) Q Did you find any oil?

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- (1) A Yes
 (2) Q Without going through what you did to find the oil let me
 (3) go to the bottom line and ask you this and we ll move on Did
 (4) the remaining residue of oil you found on north LaTouche in
 (5) your opinion have any remaining effect on the plant and animal
 (6) life in that area as we speak?
 (7) A No effect as of 1994
 (8) Q All right Now we ve gone through the six heavily oiled
 (9) areas that Mr Bush came in here and talked about and we ve
 (10) seen pictures now of all of them Did you visit other places
 (11) discussed or alluded to by Mr Bush in his testimony here?
 (12) A Yes I did
 (13) Q And would you name some of those?
 (14) A Well we visited as I indicated earlier in this testimony
 (15) we visited the beach near the village of Tattilek I visited
 (16) the north end of Long Island which is a site surveyed by Mr
 (17) Bush I visited Green Island I visited Eshamy Bay the Bush
 (18) study site there I visited Shelter Bay And there s one
 (19) more
 (20) Q Lone Island did you mention that?
 (21) A I mentioned Lone Island
 (22) Q Green Island?
 (23) A Green Island I mentioned that
 (24) Q Tattilek site?
 (25) A Tattilek I mentioned that

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- (1) Q Shelter Bay?
 (2) A Shelter Bay
 (3) Q Eshamy Bay?
 (4) A Eshamy Bay and - well that covers it
 (5) Q Did you visit all of those?
 (6) A Yes, I did
 (7) Q Did you see any oil in any of those places?
 (8) A In some of the places I saw remaining residues of oil yes
 (9) Q Did you find oil there that was not Exxon oil?
 (10) A Yes I did
 (11) Q Whether or not it was Exxon oil in fact you told me I
 (12) believe in two of them of the places had oil that was not
 (13) Exxon oil at all is that correct?
 (14) A Yes
 (15) Q Whether or not it was Exxon oil do you have any opinion
 (16) whether the traces or residue of oil found in these areas
 (17) you ve just now discussed and I won t take the time to go over
 (18) them has any remaining effect on the plant and animal life in
 (19) those areas?
 (20) A You know again you know whatever isolated residues are
 (21) left they re just simply in a form and they re in you know
 (22) locations where they can t do any harm to living things plant
 (23) or animal
 (24) Q Doctor, it is your opinion and we ve fairly gone through
 (25) and told in these heavily oiled areas where you can find

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- (1) residue of oil is it your opinion that notwithstanding there
 (2) are some remaining residues of oil in certain spots in Prince
 (3) William Sound that were heavily oiled that the Sound as we
 (4) speak today has substantially recovered?
 (5) A Absolutely Again -
 (6) Q And do the pictures tell the story?
 (7) A Absolutely
 (8) Q And they are in evidence?
 (9) A Yes
 (10) Q Now you've testified that there were remaining residues of
 (11) oil in Prince William Sound and I'll try to go through this/
 (12) quickly because unknown to us Doctor it was covered some
 (13) this morning
 (14) Does oil exist naturally in the coastal areas of southern
 (15) California including Prince William Sound?
 (16) MR O NEILL Southern Alaska
 (17) MR NEAL I mean southern Alaska
 (18) MR O'NEILL Did you spill oil in California too?
 (19) MR NEAL You'd be down there hunting it if we did
 (20) You'd be down there chasing clients wouldn't you?
 (21) I'm trying to move this on I apologize
 (22) THE WITNESS The answer is yes to both your
 (23) questions because there are natural oil seeps in southern
 (24) California as well but there are large areas of natural oil
 (25) seeps in southern Alaska

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- (1) BY MR NEAL
 (2) Q Now do you agree with the previous witness that the -
 (3) that the wind and the currents move that sediment containing
 (4) seep oil into Prince William Sound?
 (5) A Yes
 (6) Q Did you undertake an investigation to - of the natural
 (7) seeps in the area?
 (8) A Yes I did
 (9) Q Where did you go what did you do?
 (10) A Well in 1993 last year and this year, I visited a number
 (11) of natural oil seeps both east of Prince William Sound in the
 (12) Gulf of Alaska sort of upstream relative to the currents and
 (13) also in areas on the Alaska Peninsula west of Kodiak and up
 (14) toward Cook Inlet
 (15) Q Now at my request did you prepare a very brief video for
 (16) the Members of the Jury respecting this seep oil?
 (17) A Yes I did
 (18) Q All right Could we have that?
 (19) Now would you tell us what - tell us what we're seeing
 (20) here now
 (21) And by the way this is Exhibit 8879 Your Honor
 (22) A It's so short it's going to be half over by the time - so
 (23) we can start from the beginning again Mr Neal?
 (24) Q Somebody could ask for a rerun Let's go ahead right now
 (25) A If we can freeze on this for a minute that would be good

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- (1) Would it be all right if I sort of stood by here and pointed?
 (2) Q Sure Just don't stand in the way of the jury
 (3) A I promise I won't
 (4) What these red dots show are areas where oil seeps are
 (5) known to occur They don't show all the oil seeps but they
 (6) show major oil seep areas that have been known by various
 (7) surveys for many years some as early as last century
 (8) And we can see that there's this area here east of Prince
 (9) William Sound an area here near Cook Inlet and a large body
 (10) of oil seeps west of Kodiak Island around Becharof Lake Now
 (11) we can roll them
 (12) The Alaskan coastal current brings a lot of sediment past
 (13) these and whatever's associated with the sediment into Prince
 (14) William Sound and Dr Jahns described the transport of
 (15) petroleum hydrocarbons from these areas into the seafloor of
 (16) Prince William Sound What I'm simply going to do show you
 (17) what these natural oil seeps are like and particularly we're
 (18) going to look at a number of salmon streams, and everything
 (19) we're going to see here is a salmon stream
 (20) Okay First we're going to visit Oil Creek I didn't give
 (21) it the name It's on the topographic map It's west of Kodiak
 (22) Island, on the Alaskan Peninsula It's near an area called
 (23) Puale Bay And this shows the location of Oil Creek right here
 (24) and this is Puale Bay right here And what this shows - this
 (25) is a map a topographic map that shows where the ADF&G

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- (1) surveyed areas where salmon pink salmon are known to
 spawn
 (2) are located and where the little black dot that was in that
 (3) picture showed where the oil seep was right here Little blue
 (4) dot actually
 (5) So salmon stream, and this is also a salmon index stream
 (6) and what that means is that ADF&G area biologists actually go
 (7) out every year as often as they can and count fish in this
 (8) stream Okay Now, this is what a natural oil seep looks
 (9) like That bubbling stuff is natural gas as you can see
 (10) giving my hands for science showing that it burns Here I'm -
 (11) Q Let me see your fingers You still got all of them?
 (12) A Here I'm sort of skimming this natural petroleum very much
 (13) like Cook Inlet crude oil and now we're looking down Oil Creek
 (14) in the background past this little lake and - with tar in it
 (15) and the field down below and now we're going to go down into
 (16) the bed of Oil Creek
 (17) And here we are this is 1993 in our visit and this looks
 (18) like a typical upland Alaskan stream The only difference is,
 (19) the reason they call it Oil Creek is as the picture shows
 (20) that you have all up and down the upper part of it oil seeping
 (21) into the stream and running downstream
 (22) Now this is oil occurring naturally, and we're going to
 (23) now go down from the upper part of the stream which is right
 (24) up here to the area where salmon, pink salmon are known to
 (25) spawn And again when you dig around the gravel bed of Oil

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(1) Creek you find oil which is why they call it Oil Creek And
 (2) this is again some mousse and sheen on the gravel in this
 (3) creek
 (4) And when you look down again you see a typical Alaskan
 (5) stream with the bay Shelikof Straits in the background
 (6) Barbara Creek which is also on the Alaskan Peninsula is over
 (7) here and it's part of the watershed that feeds into Lake
 (8) Ugashik and ultimately into Bristol Bay And Barbara Creek is
 (9) a sockeye salmon stream and again ADF&G has surveyed this
 and
 (10) has shown this to be an area where salmon spawn right up to
 the
 (11) head of the creek sockeye salmon
 (12) These dots represent that there are a lot of seeps in this
 (13) area where they have salmon streams and we're going to look
 at
 (14) this dot here in a little more detail
 (15) Now, this little flashing area we're looking at Barbara
 (16) Creek here This flashing arrow shows the dark spot on the
 (17) hillside shown here close up with oil moving down the hillside
 (18) where this natural oil seep is This is one of the number of
 (19) seeps in the area And as you kind of move downstream from
 the
 (20) seep area it simply shows that this natural release of oil is
 (21) continuous and significant And we'll just quickly get down to
 (22) where the salmon are which is down here and you can see
 some
 (23) oil sheen along the side of the creek
 (24) Again this is where red salmon spawn in an area that has
 (25) natural inputs of petroleum

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(1) Now we're in a place called Well Creek on the Iniskin
 (2) Peninsula and this is up near Cook Inlet
 (3) Q Those dots are oil seeps?
 (4) A That's reported oil seep areas and we went to this - this
 (5) is called Well Creek and oddly enough it's near a place
 (6) called Oil Bay feeds into it and Bowser Creek which this
 (7) runs into is a salmon stream where pink salmon are surveyed
 (8) and reported by ADF&G to spawn
 (9) We're going to take a look right in this area here where
 (10) the blue dot is What you see is a pretty coastal Alaskan
 (11) meadow with a creek running through it beaver dam and you
 (12) also see along one side sheen on the water, which is, again,
 (13) naturally released from the seeps And you can skim this stuff
 (14) with a soup spoon and it's very much like Cook Inlet crude
 (15) A few yards away in the creek you have these fish juvenile
 (16) fish one species or another
 (17) Now we're going to go to Johnston Creek which is now east
 (18) of Prince William Sound and, again, this is from the area
 (19) that's responsible for the subtidal natural petroleum
 (20) background that Dr. Jahns pointed out Johnston Creek again
 is
 (21) identified as a coho salmon stream by ADF&G and this is a
 (22) major seep area And when you have an aerial view, you have a
 (23) bunch of salmon streams come together and flow out together
 (24) toward the sea with Johnston Creek And the seep area itself
 (25) looks like a typical sort of upland stream except it has oil

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(1) occurring naturally in it
 (2) And as you move downstream you can see again the release
 (3) of oil from this natural seep is chronic and continuous and
 (4) when you sort of get beyond these brushes in the background
 (5) you get to Johnston Creek And we know that the stuff is
 (6) getting downstream because now we're in the area where
 Johnston
 (7) Creek joins the sea and all throughout this gravel zone you
 (8) have coho salmon habitat you find oil sheen from natural
 (9) sources and this is you know part of whatever the
 (10) environment in this area is This is natural petroleum And
 (11) the fish are living in this area
 (12) Q That's you?
 (13) A That's me It was raining at the time so you can tell
 (14) Q Was that it?
 (15) A That's it
 (16) Q That was about an hour until I insisted he cut it down
 (17) He liked seeing himself on television
 (18) Doctor did you take samples or have samples taken of these
 (19) streams that we just discussed having natural seep oil in them?
 (20) A Yes I did
 (21) Q And did you have these samples analyzed?
 (22) A Yes I did
 (23) Q Could you tell us what were the parts per billion of this
 (24) seep oil in these streams?
 (25) A Well water samples from Barbara Creek we took two
 samples

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(1) and they were 50 and a 109 parts per billion Oil Creek in
 (2) the Alaskan Peninsula came out at one part per billion of
 (3) petroleum
 (4) Johnston Creek came out over five parts per billion and
 (5) another creek that we sampled near Johnston Creek which is a
 (6) salmon stream which is not shown on the video called
 Snowshoe
 (7) Creek came out at about two and a half parts per billion
 (8) We also took some sediment samples from Johnston Creek
 and
 (9) Snowshoe Creek and the parts per billion values again this
 (10) is for polycyclic aromatic hydrocarbons This isn't total PAH
 (11) this is just the aromatics in the oil
 (12) Q The ones we discussed with the previous witness the PAHs?
 (13) A That's correct The sediment samples ranged from 280 to
 (14) 1500 parts per billion total aromatics in the sediments from
 (15) the streambed of Johnston Creek and Snowshoe Creek
 (16) Q Doctor I - there's something I wanted to show you that I
 (17) went over There was - there was a picture in the plaintiffs
 (18) case of an island and I believe it's - what is it
 (19) Plaintiffs Exhibit 245 and 48 a picture of that or
 (20) something
 (21) I want to put this on Brother Elmo here and show you the
 (22) picture that plaintiffs admitted was taken shortly after the
 (23) spill in 1989 and we can see I think the oil streaming
 (24) around that little island Do you see that?
 (25) A Yes

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- (1) Q Now I want you to look at Exhibit 8987 Defense Exhibit
- (2) 8987 which is a map of Prince William Sound and see if you
- (3) can locate that little island on the map And I apologize I
- (4) should have gone over this before we got to the seeping oil
- (5) but -
- (6) A Okay Would you like me to locate where that island is?
- (7) Q I would You know the name of the island?
- (8) A It actually doesn't have a name
- (9) Q It's No Name Island We'll give it a name Henceforth
- (10) known as Dr Page's No Name Island Where is it?
- (11) A This little island is located in Foul Bay - and I need my
- (12) reading glasses on
- (13) Q Doctor come on this side
- (14) A Okay If you look at this map and if you look closely you
- (15) see these three little dots here and No Name Island is the
- (16) outermost - this is Foul Bay here and No Name Island is the
- (17) outermost dot that my pointer's on It's right there
- (18) Q And that's what we're seeing now on the Elmo is that
- (19) correct?
- (20) A Yes
- (21) Q Okay Now did you visit No Name Island this year?
- (22) A Yes I did
- (23) Q And did you take a picture of No Name Island this year?
- (24) A Yes I did
- (25) Q I show you what is in evidence - I show you what is in

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- (1) evidence as Defendants Exhibit 8985 is that correct?
- (2) A Yes it is
- (3) Q And what is that sir? When was this picture taken?
- (4) A This picture was actually taken by me through the window of
- (5) a helicopter going back to Anchorage on June 22nd 1994
- (6) Q Last week?
- (7) A Last week
- (8) Q And that's the same little island that the Members of the
- (9) Jury can see on the video screen This is a picture of that
- (10) taken this week?
- (11) A Yes it is
- (12) Q Does this picture Defense Exhibit 8985 accurately
- (13) represent what one sees on that island as of today or as of
- (14) last week?
- (15) A Yes it absolutely does
- (16) MR NEAL Thank you Doctor Looks like to me I've
- (17) managed to eat up the day so I'll leave you to the tender
- (18) mercies of Mr O'Neill tomorrow morning I guess
- (19) THE COURT We'll adjourn for the day now ladies and
- (20) gentlemen Please don't read or listen to anything about our
- (21) case during our recess We will reconvene at 8:00 tomorrow
- (22) morning
- (23) Before you go one thing that I need to tell you that we
- (24) discussed at this point yesterday after you all left the
- (25) lawyers sort of ganged up on me and told us how they'd really

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- (1) really like to have Friday off this Friday Since it is a
- (2) long weekend since we do have a lot of people here from out of
- (3) town, people want to take a long weekend so we will stand
- (4) down
- (5) this Friday as well as the following Monday So it means
- (6) you've got a four day weekend instead of three
- (7) MR NEAL Unless they really want to come back and
- (8) work
- (9) THE COURT Do you want to - we could change Mr
- (10) Neal
- (11) MR NEAL I think not only do you have the unanimity of
- (12) the lawyers but the jurors, too Judge so I say it's a done
- (13) deal
- (14) THE COURT Very well Thank you ladies and
- (15) gentlemen We're in recess until 8:00 tomorrow morning
- (16) (Recess at 2:00 p.m.)

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 (18) DX8760 DX8776 DX8812 DX8886 DX8888 DX8895 offered
 5361
 (19) 4954 offered 5395
 (20) 5266 A offered 5395
 (21) 607 offered 5408
 (22) 446 offered 5430
 (23) 1911 A offered 5492
 (24) 1911-B offered 5493
 (25) 1911 C offered 5495

(1) 446 received 5430
 (2) 8641 received 5434
 (3) 5505 A received 5438
 (4) 1911 A received 5492
 (5) 1911 B received 5494
 (6) 1911 C received 5496
 (7) 1911 D received 5498
 (8) 1911 E received 5499
 (9) 1911 F received 5501
 (10) 1911 G received 5503

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(1) 1911 D offered 5498
 (2) 1911 E offered 5499
 (3) 1911 F offered 5501
 (4) 1911 G offered 5503
 (6) 6077 received 5359
 (7) DX104 DX446 DX447 DX478 DX601 DX602 DX458 DX444
 (8) DX603 DX604, DX4831, DX8639 DX8640 DX8712 DX477
 (9) DX1095 DX1441 DX8879 DX8881 DX8882 DX8889, DX8890
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 (21) DX8648 A, DX8649 B DX8651 B DX8653 DX8753 DX8754
 (22) DX8760, DX8776 DX8812, DX8886, DX8888 DX8895 received
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 (23) 4954 received 5395
 (24) 5266 A received 5395
 (25) 607 received 5408

(1) STATE OF ALASKA)
 (2) Reporter s Certificate
 (3) DISTRICT OF ALASKA)
 (6) I Joy S Brauer a Registered Professional
 (7) Reporter and Notary Public
 (8) DO HERBY CERTIFY
 (9) That the foregoing transcript contains a true and
 (10) accurate transcription of my shorthand notes of all requested
 (11) matters held in the foregoing captioned case
 (12) Further that the transcript was prepared by me
 (13) or under my direction
 (14) DATED this day
 (15) of 1994
 (21) JOY S BRAUER RPR
 Notary Public for Alaska
 (22) My Commission Expires 5 10 97

Look-See Concordance Report

UNIQUE WORDS 3,164
TOTAL OCCURRENCES 15,297
NOISE WORDS 385
TOTAL WORDS IN FILE 46,944

SINGLE FILE CONCORDANCE

CASE SENSITIVE

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(1) IN THE UNITED STATES DISTRICT COURT
 () FOR THE DISTRICT OF ALASKA
 In re) Case No A89 0095 CIV (HRM)
 (5)) Anchorage Alaska
 The EXXON VALDEZ) Wednesday June 29 1994
 (6)) 8:00 a m

TRANSCRIPT OF PROCEEDINGS

TRIAL BY JURY 36th DAY

BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE

(12) VOLUME 32 Pages 5567 5784

Realtime Transcription

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(1) PROCEEDINGS
 (2) (Jury in at 8 00 a m)
 (3) (Call to Order of the Court)
 (4) THE COURT Good morning ladies and gentlemen This
 (5) is the continuation of trial in case A89-0095 civil in re the
 (6) Exxon Valdez
 (7) We re going to continue with Dr Page I believe
 (8) MR O NEILL I have unsightly dandruff
 (9) MS STEWART Your Honor before we continue this
 (10) could we read in a list of exhibits to which the defendants
 (11) would like to offer into evidence?
 (12) THE COURT Fine
 (13) MS STEWART Thanks DX5099 DX5111 A DX5120
 (14) DX7441 DX8423 DX8424 DX8477 A DX8681 DX8762
 DX8787-A
 (15) DX8899 DX1820 DX1821 A and DX8658 A
 (16) We offer these exhibits into evidence
 (17) (Exhibits DX5099 DX5111 A DX5120 DX7441 DX8423
 DX8424
 (18) DX8477 A DX8681 DX8762 DX8787 A DX8899 DX1820
 DX1821 A
 (19) and DX8658-A offered)
 (20) MR O NEILL No objection
 (21) THE COURT Thank you sir The defendants exhibits
 (22) just announced are admitted
 (23) (Exhibits DX5099 DX5111 A DX5120 DX7441 DX8423
 DX8424
 (24) DX8477 A DX8681 DX8762 DX8787 A DX8899 DX1820
 DX1821 A
 (25) and DX8658 A received)

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(1) MR O NEILL Sir, my name is Brian O'Neill
 (2) THE COURT Dr Page, you understand you re still
 (3) under oath?
 (4) THE WITNESS Yes I do Your Honor
 (5) THE COURT Mr O'Neill proceed
 (6) CROSS EXAMINATION OF DR DAVID PAGE (Cont g)
 (7) BY MR O NEILL
 (8) Q You have some wonderful photographs that you brought
 with
 (9) you and I am interested in what has been admitted as 8944
 and
 (10) I m interested in the whole photograph but would it be fair to
 (11) say that this photograph your photograph does depict the
 (12) grandeur of Prince William Sound?
 (13) A Yes it does
 (14) Q And this photograph 8942 I will admit is one of the best
 (15) ones that I've ever seen and if you get out of the business
 (16) that you re in you ought to go into coffee table books It
 (17) again depicts the grandeur of Prince William Sound Would
 you
 (18) agree with that?
 (19) A Yes I do
 (20) Q And 8942 in 1989 was heavily oiled this area was heavily
 (21) oiled wasn't it?
 (22) A Yes it was
 (23) Q And indeed with an area as beautiful as that in 1989 if
 (24) you went to areas here in Bay of Isles and other places in
 (25) Prince William Sound you would see scenes like we saw

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- (1) yesterday in Defendants Exhibit 1441 that s a correct
 (2) statement? Oil on the beaches?
 (3) A Yes it is
 (4) Q And like you showed us yesterday in Defendants Exhibit
 (5) 1095 we d see scenes like this wouldn t we?
 (6) A Yes
 (7) Q And indeed much of the shoreline of Prince William Sound
 (8) was oiled as a result of the oil spill?
 (9) A No it wasn t In fact over 80 percent of the shoreline
 (10) of Prince William Sound was not oiled at the time of the spill
 (11) in 1989 We re talking about a fraction of the shoreline and
 (12) shorelines as are depicted there in 1989 were even a smaller
 (13) fraction of the shoreline
 (14) Q This kind of oiling for the environment and this area and
 (15) down through the intertidal area, this kind of oiling presents
 (16) a shock to the ecosystem doesn t it?
 (17) A In 1989 yes
 (18) Q Just sort of bams it doesn t it?
 (19) A Like any natural disaster yes
 (20) Q You used the term disaster just now and would it be fair
 (21) to say that the Exxon Valdez oil spill was a disaster?
 (22) A I think like the earthquake of 1984 nobody can deny that
 (23) in 1989 for beaches like that the oil spill was indeed a
 (24) disaster
 (25) Q And I listened to your testimony and I also listened to the

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- (1) picked up if you re looking at it quantitatively You were
 (2) here for that weren t you?
 (3) A Yes I was
 (4) Q And that s what he testified to isn t it?
 (5) A Yes he did
 (6) Q Now I was interested in your answers to some questions
 (7) because I was surprised that you were asked the questions
 (8) yesterday but you were asked the question do you have any
 (9) opinion as to whether the spill as we sit here today has any
 (10) remaining effect on the plant and animal life I ll use this
 (11) new word I ve learned learned from Mr Sanders biota biota
 (12) at Prince William Sound Do you recall being asked that
 (13) question?
 (14) A Yes
 (15) Q I read the question off of the transcript in point of
 (16) fact sir you are aware that the State and federal trustees
 (17) are of the view that, as we sit here today the following
 (18) resources are not recovering Common murre s harbor seals
 (19) harlequin ducks intertidal ecosystem marbled murrelets
 (20) Pacific herring, pigeon guillemots pink salmon sea otters
 (21) sockeye salmon in the Kenai River and the subtidal ecosystem
 (22) are the resources that are not recovering that s their view
 (23) and you re aware of that aren t you?
 (24) A (No response)
 (25) Q I m not saying it s your view I m saying it s the view of

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- (1) testimony of Dr Jahns and indeed, the extent of oiling in
 (2) 1989 was such that mankind Exxon Corporation with its
 (3) resources to a great extent had to rely on God or Mother Nature
 (4) to clean it up isn t that right?
 (5) A I think that it s fair to say that the cleanup activities
 (6) that were done gave nature a head start, but in the end after
 (7) getting a head start with whatever cleanup is done, the best
 (8) processes are natural processes once you finish cleaning up
 (9) the worst deposits of oil
 (10) Q This mess was so big that in fact as a cleanup tool or
 (11) mechanism we had to rely on the earth?
 (12) A That s not a fair characterization Again the cleanup
 (13) effort that was done gave Prince William Sound s affected areas
 (14) a head start on recovery
 (15) Q How much oil was picked up by Exxon Corporation and how
 (16) much oil was cleaned off by Mother Nature?
 (17) A Again in the heavily oiled places like we re seeing here
 (18) a great deal of the oil was picked up by the cleanup
 (19) operation
 (20) For the majority of the oil affected areas which were in
 (21) fact lightly oiled it was best to let Mother Nature take care
 (22) of the job of natural cleanup
 (23) Q Now you were asked yesterday - well Dr Jahns testified
 (24) that the vast majority of the oil was cleaned up or removed
 (25) from the shorelines by natural forces as compared to what was

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- (1) the State and federal trustees as we sit here today and you re
 (2) aware of that?
 (3) A I don t know whether that s the view of the State and
 (4) federal trustees as of June 1994
 (5) Q How about November of 1993 when they published the draft
 (6) restoration plan You reviewed the draft restoration plan
 (7) didn t you?
 (8) A No I did not review the draft restoration plan in detail
 (9) I might have received it but I didn t read it
 (10) Q So it was sent to you?
 (11) A It might have been
 (12) Q Now, have you reviewed this publication?
 (13) A I haven t reviewed it no
 (14) Q Was it sent to you?
 (15) A It might have been
 (16) Q And you re aware that it describes long term impacts to
 (17) intertidal communities subtidal communities birds manne
 (18) mammals fish aren t you? You re aware of that?
 (19) A Yes I m aware of what those documents purport to be
 (20) Q And these documents come from the State and federal
 (21) trustees?
 (22) A Those are not peer reviewed scientific documents Those
 (23) documents are simply documents describing how they want to
 (24) spend restoration money To the best of my knowledge I didn t
 (25) see any data in any of those documents telling me what those

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- (1) studies that may have been referred to in there are saying
 (2) about the environment as it exists in 1994
 (3) Q So you just said I didn't see any data just a second ago
 (4) you said I didn't see any data So you did read these
 (5) documents didn't you?
 (6) A I said I may have looked at them and the reason I didn't
 (7) read them or review them in any detail was - is that when I
 (8) you know get a stack of documents to look at if there's no
 (9) real data in them I don't really take a close look at them
 (10) And I don't think I remember you know seeing any documents
 in
 (11) those - data in those documents Again if I missed anything
 (12) and if I should have read those more thoroughly I'll be glad
 (13) to take a closer look at them now
 (14) Q Are you aware that the trustees in the document describe
 (15) the resources that I read as being resources that are not
 (16) recovering?
 (17) A It's my understanding that that's what those documents
 (18) purport to do But again I've talked to scientists who are
 (19) working on these problems who are government scientists and
 (20) trustee's scientists as recently as November of 1993 and what
 (21) they're telling me based on my conversations with them at
 (22) professional meetings is not what you represent those
 (23) documents as saying
 (24) Q What I represent the document as saying let's look at a
 (25) page from the document What I represent the document as

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- (1) saying there's an implication I'm misrepresenting what's in
 (2) the document Let's put the document up And it says
 (3) resources not recovering the following resources show little
 (4) or no sign of recovering nearly five years after the spill and
 (5) it lists the resources That's what the document says It
 (6) isn't what I represented to say isn't that right?
 (7) A Well again as I said if that's what the document says
 (8) there has to be some basis for the document saying that and
 (9) what I'm saying is that I don't know that the basis is for
 (10) those you know trustee documents All I know is what I have
 (11) learned by talking with professional colleagues who are
 working
 (12) on these problems
 (13) Q How many scientists do the trustees have working for them?
 (14) A I don't know
 (15) Q Dozens isn't that right?
 (16) A Probably
 (17) Q Of all disciplines just like Exxon?
 (18) A Probably
 (19) Q You know that to be the case?
 (20) A Again outside of my area of expertise on the shoreline
 (21) program I don't know how many scientists are working on birds
 (22) and sea otters and so forth
 (23) Q And herring and salmon?
 (24) A Yes
 (25) Q I was interested in the way you phrased your answers to the

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- (1) questions yesterday and your answers - and if I'm wrong here
 (2) correct me because I want to focus essentially on what your
 (3) opinion is but my understanding of your answers was that the
 (4) oil that is left there poses no threat of harm or words to
 (5) that effect. Is that a fair statement?
 (6) A Yes
 (7) Q I'm not interested in the next couple of questions with the
 (8) oil that is left there but - let me see if I can think of a
 (9) common example There are many situations that we know of
 (10) where the toxic agent poison pollutant the active agent
 (11) does its damage and then goes away You understand the
 (12) concept? Fetal Alcohol Syndrome a baby that is harmed
 because
 (13) of Fetal Alcohol Syndrome, after the first five or ten days
 (14) after its birth no longer has any alcohol in it The agent
 (15) that caused the harm is gone isn't that right?
 (16) A Yes
 (17) Q You're not saying are you sir in your testimony that you
 (18) were qualified on yesterday you were not contending that the
 (19) oil in 1989 did not cause harm to natural processes in 1989
 (20) You were limiting your testimony to the fact that oil that
 (21) leaches off of the beaches in 1994 doesn't cause that kind of
 (22) harm is that a fair statement?
 (23) A Yes
 (24) Q And indeed the shocks that this kind of disaster have on
 (25) the ecosystem on herring and salmon is the subject of a whole

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- (1) different line of studies than what you came here yesterday to
 (2) testify about?
 (3) A Well with one very important qualification and that is
 (4) that yesterday I presented evidence that shows that petroleum
 (5) occurs in many salmon producing areas naturally and
 therefore
 (6) we have to understand there is a definite dose/response
 (7) relationship with things like petroleum and the environment as
 (8) there are with other contaminants
 (9) Q We'll get to that in a couple of minutes That's the
 (10) thesis that oil is good for fish?
 (11) A No That's not what I said I said that petroleum at
 (12) levels below a threshold of effect does not exert harm to
 (13) natural environments We saw that yesterday
 (14) Q Let me ask one question With regard to any of the fish
 (15) that were in those streams where oil naturally occurred did
 (16) you do studies on the fish?
 (17) A The only studies that I did was to satisfy myself that
 (18) those salmon streams that we surveyed had fish that were
 known
 (19) to return year after year and that those salmon streams
 (20) provided an environment that permitted those fish to reproduce
 (21) and return
 (22) Q Did you pick up any of the fish and touch any of the fish?
 (23) A When we visited them there weren't any adult fish in the
 (24) streams
 (25) Q So your - the answer to my question is I picked up none

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- (1) of the fish and touched the fish?
 (2) A I did not pick up any fish and touch the fish
 (3) Q With regard to those salmon streams did you enumerate the
 (4) numbers of fish in those salmon streams?
 (5) A I looked up data from ADF&G that did enumerate the salmon
 (6) in oil creek on the Alaskan Peninsula
 (7) Q Would you explain to us if you could as you sit here
 (8) today what the history of those fish run numbers are by
 (9) number?
 (10) A Well the Alaskan Department of Fish and Game -
 (11) Q They know what ADF&G is Tell us what the numbers are
 (12) A The - over a number of years the area biologists in ADF&G
 (13) go out and make counts of fish in certain streams to establish
 (14) the escapement or the run Oil Creek is one of those streams
 (15) that they actually count fish They do that by an aerial
 (16) survey so they get a snapshot and then estimate numbers from
 (17) that
 (18) Over the last 11 years when ADF&G counted the escapement
 (19) in Oil Creek to the best of my recollection the numbers of
 (20) fish that they surveyed in that one little stream ranged from
 (21) about 8 000 up to 73 000 pink salmon
 (22) Now a lot of the variability in numbers like that are a
 (23) function of you know how they were flying that day or what
 (24) snapshot they took but the fact remains that historically
 (25) that particular stream that we - I showed you in that video

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- (1) does support a sizable population of salmon
 (2) Q And does that stream look like this?
 (3) A In places
 (4) Q It does?
 (5) A In places as I showed you in the video in places there
 (6) are - you know there is oiled gravel In places there is
 (7) oil coming out of the banks of that stream, and as I showed you
 (8) in the video yesterday in places where you dig around in the
 (9) gravel where the salmon spawn you can find oil in the gravel
 (10) Q So your testimony is the video that you showed the jury
 (11) yesterday shows a scene like this on that Oil Creek?
 (12) A That Oil Creek does not have boulder cobble beach on it.
 (13) Q Now you - I want to talk a little bit about your kind of
 (14) science and one of the things that you did as you went out and
 (15) visited the sites was to observe isn't that right?
 (16) A Yes
 (17) Q So your powers of observation are important to what you do
 (18) I assume?
 (19) A Yes
 (20) Q How careful you are?
 (21) A Yes
 (22) Q Whether you bring a predisposition to the subject matter is
 (23) important isn't it?
 (24) A Yes
 (25) Q So that if you're careful, you have good observation

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- (1) powers you bring no predisposition you're open minded you
 (2) tend to do a better job than if you weren't those things?
 (3) A Yes
 (4) Q And indeed it's helpful if you're going to do long term
 (5) studies that if you go to one of these sites and you make a
 (6) mistake that you remain open minded genial so that your
 (7) study
 (8) doesn't get biased?
 (9) A Yes
 (10) Q You make a mistake you accept the mistake you don't
 (11) blame
 (12) it on somebody else you move on that's a correct statement?
 (13) A Yes
 (14) Q And there are a variety of ways we can test that thesis
 (15) with the variety of work you did One is to go back over your
 (16) history Another one is if we can go back and take a look
 (17) actually at what you did and in some instances you videotaped
 (18) what you did didn't you?
 (19) A Yes
 (20) MR O NEILL. And I'm going to show you and the jury
 (21) one of those videotapes Play the videotape
 (22) (Videotape Played as follows)
 (23) VIDEO SPEAKER This is the ICF transect site in
 (24) Shelter Bay It is now 10 30 and very nearly low tide We are
 (25) now looking right down the transect that ICF did We've
 (26) documented it from pictures in the report We make special
 (27) mention of these rocks shown in this frame Contrary to ICF's

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- (1) assertions there are mussels limpets barnacles on these
 (2) rocks It is hard to believe that in the space of one year
 (3) this could go from being devoid of microfauna in the upper
 (4) intertidal zone as was asserted to something as rich as this
 (5) Again, no oil, contrary to ICF's assertions These rocks
 (6) contrary to ICF's assertions have no oil staining, no
 (7) coating Their statement in their report is unfounded in
 (8) fact. This big rock, which is shown in one of the site
 (9) pictures anyone not familiar - anyone not familiar with
 (10) manne ecology and unwilling to entertain possibilities other
 (11) than effects of the oil spill - this means through ICF's
 (12) assertion that 25 percent of this area is covered with oil is
 (13) totally unfounded in fact and is not even speculative It's
 (14) incorrect.
 (15) It's difficult to believe that someone could look here and
 (16) say that there's no fauna Preceding segment of tape dealing
 (17) with the ICF site is incorrect We reestablished the actual
 (18) site We were one cove over too far to the south due to the
 (19) poor documentation of the site from the ICF report
 (20) The next roll of tape will deal with the actual - this is
 (21) the actual ICF transect.
 (22) (Videotape concluded)
 (23) BY MR O NEILL.
 (24) Q And that was you and you were at the wrong site?
 (25) A As I said, I profit from my mistakes and I think that the

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- (1) tape as you played it in a very edited form I might add
 (2) really bears out the things I was trying to say yesterday
 (3) namely that tape shows a very rich and abundant intertidal
 (4) community of plants and animals living on the rocks even in a
 (5) place that originally had oil
 (6) Moreover we had a very hard time with some of the sites
 (7) because the - Mr Bush did not describe where he went very
 (8) well and did not provide detail enough data to really home in
 (9) on the sites
 (10) I can tell you this we are now confident that we went to
 (11) every place he actually went to In some cases as in Shelter
 (12) Bay we had to you know regroup and go and make sure that
 (13) we
 (14) went to the right site because we didn't want to do an
 (15) incorrect assessment of the places where he went That tape
 (16) demonstrates how thorough and open-minded we were in our
 (17) approach to our shoreline surveys
 (18) Q We saw the tape and we can each of us draw our own
 (19) conclusions about how open minded we are about your
 (20) shoreline
 (21) surveys and I'll move onto a new topic okay?
 (22) Now another way we can take a look at the rigorosity of
 (23) this shoreline survey process of Exxon s - and it is Exxon s,
 (24) isn't it? You work for Exxon Corporation as a consultant?
 (25) A (Nods head)
 (26) Q Is to see whether you were given any marching orders early
 (27) on with regard to the shoreline ecology project I mean that

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- (1) A Yes
 (2) Q And indeed in all likelihood you had a copy of it at this
 (3) meeting because you were at the meeting isn't that right?
 (4) A I probably did
 (5) Q And who was at the meeting?
 (6) A That was so long ago I don't remember I know I was at
 (7) that meeting I know that my colleague from Bowden Dr
 (8) Gilfillan was at that meeting Dr Boehm from Arthur D Little
 (9) was probably at that meeting Exxon scientists were also at
 (10) that meeting but again I'd have to see who was there I
 (11) didn't keep a record of who actually attended that meeting
 (12) Q A lot of folks were there?
 (13) A Yes there were
 (14) Q In fact it was one of the final meetings with regard to
 (15) the design construction of the Exxon shoreline ecology
 (16) program isn't that a correct statement?
 (17) A Yes
 (18) Q And I'm going to come back to this document but you know
 (19) what I'm going to ask you and I'll ask it right now
 (20) Scientists when they decide to go out and do a study
 (21) shouldn't predispose them to the answer or assume the answer
 (22) isn't that right?
 (23) A Absolutely
 (24) Q And this document this meeting agenda has as its review
 (25) objective at least in writing to rigorously document recovery

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- (1) would be an interesting thing to explore wouldn't it?
 (2) A Yes
 (3) Q And would you agree with me with this proposition that in
 (4) exploring it it's easier to go back and take a look at the
 (5) written word than it is to trust our recollections biases
 (6) those kinds of things? You understand the concept you can't
 (7) change the written word?
 (8) A Yes
 (9) Q I want to show you what has been marked - I'm not sure
 (10) whether it's been preadmitted or not It's Plaintiffs' Exhibit
 (11) 1969?
 (12) MR NEAL Could I have a look at it first?
 (13) MR O NEILL I'll offer 1969 Plaintiffs 1969
 (14) (Exhibit 1969 offered)
 (15) THE COURT Is there objection?
 (16) MR NEAL No objection
 (17) THE COURT Plaintiffs 1969 is admitted
 (18) (Exhibit 1969 received)
 (19) BY MR O NEILL
 (20) Q And Plaintiffs 1969 is a meeting agenda for a meeting that
 (21) was held in March 29 1990 isn't that right?
 (22) A Yes
 (23) Q And you've seen this before?
 (24) A Yes
 (25) Q And it was discussed at your deposition?

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- (1) of oiled shorelines over time in relation to the initial degree
 (2) of oiling
 (3) Now you as you sit here today disagree with the fact that
 (4) this in fact either was the review objective or you contend
 (5) that document means measure I'm trying to be fair about the
 (6) document Are my statements fair that you either take issue
 (7) with it or would interpret it as saying roughly measure
 (8) recovery of oiled shorelines?
 (9) A Well the fact of the matter is the verb to document means
 (10) to present or measure in a factual manner We watch
 (11) documentaries on television and documentaries are movies that
 (12) present in a factual manner something that happened
 (13) historically And when you read that whole thing not just the
 (14) highlighted part what that shows is that we went out and
 (15) planned in a fact - in a factual way to document
 (16) factually - to document means to present or measure factually
 (17) in an unbiased way the unhighlighted part down at the bottom
 (18) of that first paragraph that is on the previous page to the one
 (19) that's shown there has the word unbiased in it and I think
 (20) unbiased and factual is the keystone of the studies that we
 (21) started planning in 1990
 (22) Q And on the second page of the document it goes one step
 (23) beyond that with regard to an objective and it says
 (24) demonstrate and document effective nearshore on shore
 (25) marine communities are recovering Demonstrate and document isn't

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- (1) that what the document says?
 (2) A Again -
 (3) Q My question is is that what the document says?
 (4) A That is what that particular document that was not written
 (5) by me says
 (6) Q This document was handed out by Exxon Corporation to its
 (7) scientists at a meeting in March of 1990 with regard to the
 (8) study program is that a correct statement?
 (9) A Yes it is
 (10) Q Now I want to test a little bit just so you know where
 (11) I'm coming from your history And it's my understanding
 (12) that - what was the first spill you worked on?
 (13) A The Tomano spill
 (14) Q And the Tomano spill was when?
 (15) A The Tomano spill was in 1972
 (16) Q And in the Tomano spill your work was for the State of
 (17) Maine?
 (18) A Yes it was
 (19) Q And since that time you've had extensive oil spill
 (20) experience you've worked on a lot of spills?
 (21) A Yes
 (22) Q But since that time all of your work has been either on
 (23) behalf of oil companies or their foundations shipping
 (24) companies who ship oil or their insurance companies isn't
 (25) that right?

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- (1) A No
 (2) Q Well let's go over the spills you talked about yesterday
 (3) and figure out who you worked for on them You work with this
 (4) Ed Gilfillan?
 (5) A Yes
 (6) Q And you did consulting work with regard to the vessel Zoie
 (7) Coltronic (ph)?
 (8) A Zoie Coltronic
 (9) Q And what was that project?
 (10) A That project was a study in connection with litigation of
 (11) an oil spill in Puerto Rico
 (12) Q And you represented or worked for the vessel owners is
 (13) that correct?
 (14) A No
 (15) Q It isn't?
 (16) A I represented the insurance company that -
 (17) Q You represented -
 (18) A The underwriters
 (19) MR NEAL Excuse me would you let him finish his
 (20) answer Mr O'Neill?
 (21) THE WITNESS I represented the underwriters of the
 (22) vessel
 (23) MR O NEILL Are you finished?
 (24) THE WITNESS Yes
 (25) BY MR O NEILL.

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- (1) Q You represented the insurance company of the vessel
 owners
 (2) against plaintiffs?
 (3) A Yes
 (4) Q And you represented the Presidente in that oil spill is
 (5) that right?
 (6) A Yes
 (7) Q And who did you represent there?
 (8) A The underwriters of the vessel
 (9) Q The insurance company? Underwriters are insurance
 (10) companies?
 (11) A Yes
 (12) Q And you did work concerning a Mobil spill on the Columbia
 (13) River?
 (14) A Yes
 (15) Q And that was for Mobil Oil Company?
 (16) A Yes
 (17) Q And you did work with regard to the vessel owner at a spill
 (18) concerning the Apex Houston?
 (19) A Yes
 (20) Q That was for the vessel owner the spillers?
 (21) A The insurers
 (22) Q You did work with regard to the 1987 spill of the Glacier
 (23) Bay here in Cook Inlet that interrupted the 1987 fishing
 (24) season?
 (25) A Yes

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- (1) Q And who was that for?
 (2) A The insurers
 (3) Q And you've done work for the American Petroleum Institute
 (4) you said do you recall that?
 (5) A Yes
 (6) Q What is the American Petroleum Institute?
 (7) A The American Petroleum Institute is a petroleum institute
 (8) that conducts education and public affairs and research
 (9) activities on behalf of the petroleum industry But I might
 (10) simply say that we're not reading the complete list of oil
 (11) spills that I've enumerated You left some important ones out
 (12) Q I have some more
 (13) A Oh okay
 (14) Q At your program at Bowden your little operation that you
 (15) and Gilfillan run a major funding source of that is the
 (16) American Petroleum Institute isn't it?
 (17) A It has been in the past We did a big project in 1980 to
 (18) 1984
 (19) Q And the Mobil Oil Foundation contributes to this little
 (20) institute of yours and Ed Gilfillan doesn't it?
 (21) A Yes, just like Masterpiece Theater and public television
 (22) Q So you and Gilfillan and Masterpiece Theater and public
 (23) television are all in the same pot?
 (24) A That's exactly correct
 (25) Q And the Arco Foundation has given you unsolicited

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- (1) donations hasn't it?
 (2) A Yes
 (3) Q Just here's money guys from Arco Oil Company?
 (4) A It was program support for us yes
 (5) Q And you worked on a program for another spill in Prince
 (6) William Sound the Arco Anchorage?
 (7) A That spill was in Puget Sound
 (8) Q I'm sorry And who did you represent there?
 (9) A Arco
 (10) Q With regard to your work in this particular situation this
 (11) case the colleagues - who are the colleagues that you worked
 (12) with in this particular study?
 (13) A As I indicated yesterday I've worked with Dr Gilfillan on
 (14) a number of oil spill projects over the last 20 years many of
 (15) which you did not mention were supported by the State of
 (16) Maine
 (17) In addition I've worked with Dr Paul Boehm Arthur D
 (18) Little worked with Dr Greg Douglas of Battelle Ocean
 (19) Sciences Dr Neff worked with Dr Ted Bence of Exxon
 (20) Production Research and a number of other analysts at Exxon
 (21) that there wasn't time to mention I'll be glad to be more
 (22) specific if you wish
 (23) Q Well this really isn't one of those acknowledgments on the
 (24) book A D Little and Battelle are both Exxon vendors aren't
 (25) they?

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- (1) A They are companies that do environmental consulting work
 (2) for a variety of clients both you know private and
 (3) governmental
 (4) Q I just asked you whether Exxon - whether Battelle and A
 (5) D Little were Exxon vendors and you did not answer the
 (6) question did you?
 (7) A What do you mean by the term vendor?
 (8) Q Are they taking money from Exxon to do studies in this
 (9) case?
 (10) A Yes
 (11) Q Okay And with regard to your work with the Exxon
 (12) scientists it's essentially a collaborative or interactive
 (13) effort isn't that right?
 (14) A Yes
 (15) Q And the Exxon scientists substantively review your work
 (16) don't they?
 (17) A Yes
 (18) Q Now you were at the ASTM conference weren't you?
 (19) A Yes
 (20) Q And as part of your preparation at the ASTM conference, you
 (21) met with Exxon's media relations people to help you prepare for
 (22) dealing with the press didn't you?
 (23) A Yes
 (24) Q And you met with a media consultant for several hours
 (25) didn't you?

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- (1) A Yes
 (2) Q And in part in meeting with that media consultant you
 (3) were told how to sit and how to keep your hands in front of
 (4) you weren't you?
 (5) A Absolutely
 (6) Q Thank you And with regard to getting ready for the ASTM
 (7) conference the public relations people told you to think about
 (8) what messages you wanted to get across and this was what you
 (9) called a pregame practice wasn't it?
 (10) A Well can you be more specific?
 (11) Q Have you ever used the phrase "pregame practice" with
 (12) regard to your meetings with the media consultants prior to the
 (13) ASTM conference?
 (14) A In -
 (15) Q Is that specific enough?
 (16) A Well again, let me explain There were a bunch of
 (17) scientists people like me who had never interacted with news
 (18) media before and interacting with news media is a very
 (19) intimidating process Certainly you know I would have found
 (20) it so And I think that it was only natural that Exxon wanted
 (21) to make sure I didn't walk into an interview with my you know
 (22) shirt unbuttoned or something like that And so that what
 (23) these you know sessions with these media consultants were
 (24) simply a lot of very common sense things to make sure that I
 (25) accurately said the things that I was trying to present in this

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- (1) scientific meeting
 (2) And so if you characterize it as a pregame practice it
 (3) simply means that you know I don't go into a - you know
 (4) have somebody stick a microphone in my face for the first time
 (5) and expect to sort of stand there and look at the camera like
 (6) I'm you know looking down the barrel of a deer rifle
 (7) Q Did you ever use the phrase "pregame practice"?
 (8) A I might have I don't remember doing it
 (9) Q Thank you And at the pregame practice or during the
 (10) pregame practice sessions they told you to physically present
 (11) yourself exactly as you're presenting yourself right now hands
 (12) in front leaning forward isn't that right?
 (13) A No What they told me to do was to appear like I would
 (14) normally appear sitting at my desk talking to somebody which
 (15) is the way I do it
 (16) Q Now I want to talk a little bit about these Katalla
 (17) seeps Katalla seeps have never closed to your knowledge a
 (18) fishing season have they?
 (19) A Not to my knowledge
 (20) Q And Katalla seeps have never impacted the price of fish
 (21) have they?
 (22) A Not to my knowledge
 (23) Q And you're not contending as you sit here today that the
 (24) Katalla seeps had any impact adverse impact on the intertidal
 (25) areas of Prince William Sound are you?

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- (1) A No
- (2) Q So the Katalla seeps – and you re not contending with
- (3) regard to the crash in pink salmon in 1992 and 1993 that the
- (4) Katalla seeps caused the crash in pink salmon runs in those two
- (5) years are you?
- (6) A All I m contending is that there are pink salmon where oil
- (7) naturally occurs in the environment
- (8) Q And you re not contending that the Katalla seeps caused a
- (9) crash with regard to this very dramatic crash with regard to
- (10) herring in the last year or so are you?
- (11) A No
- (12) Q The Katalla seeps to your knowledge had nothing to do
- (13) with any of that did they?
- (14) A No
- (15) Q And indeed just so we know you do not represent that seep
- (16) oil is a contributor to the intertidal hydrocarbon background
- (17) in Prince William Sound do you?
- (18) A I do not represent that seep oil is a contributor to the
- (19) intertidal hydrocarbon background It is a contributor to the
- (20) subtidal hydrocarbon background
- (21) MR O NEILL. I have nothing further Doctor thank
- (22) you
- (23) THE COURT Redirect?
- (24) MR NEAL Thank you
- (25) REDIRECT EXAMINATION OF DR DAVID PAGE

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- (1) BY MR NEAL
- (2) Q Doctor Mr O Neill asked you about working for various
- (3) people in oil spills and you said you re not telling them
- (4) all Who else have you worked for in oil spills?
- (5) A Well a number of oil spills We worked with the State of
- (6) Maine in addition to the Tomano spill For example in 1976
- (7) 77 78 we spent a great deal of time and effort supported
- (8) by the State of Maine to help them do a damage assessment of
- (9) a
- (9) major pipeline break of jet fuel which is very toxic material,
- (10) on a large cove in Searsport Maine
- (11) In addition to that we did a beach restoration project
- (12) with the State of Maine in 1980 that was actually funded by
- (13) Exxon production research, but the State of Maine and Bowden
- (14) College actually did the work with that support.
- (15) I might add that the major project we did in 1980 to 1984
- (16) funded by the American Petroleum Institute was in conjunction
- (17) with the State of Maine And again I emphasize that we have
- (18) been a professional resource over the years for the State of
- (19) Maine and have a very close working relationship with a variety
- (20) of state agencies and it s simply worked out that these other
- (21) spills mentioned we worked with other parties There s
- (22) nothing wrong with working for private, you know industry
- (23) Q Now Doctor if I may approach the witness Your Honor and
- (24) hand him – I hand you Plaintiffs Exhibit 1969, a portion of
- (25) the top part was read to you or shown to you by Mr O Neill

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- (1) Would you read the remaining part of that paragraph?
- (2) A Yes I will And again this describes the – you know
- (3) the way all of the scientists felt very strongly about the
- (4) scientific work we did It said that we – objective was to
- (5) rigorously document or demonstrate show factually measure
- (6) factually recovery of oiled shorelines over time in relation
- (7) to the initial degree of oiling and substrate habitat type
- (8) using a statistically defensible unbiased – key word
- (9) unbiased sampling plan And then it goes on to say recovery
- (10) measured in terms of a whole variety of scientific parameters
- (11) to do –
- (12) Q What does the word – what does unbiased mean to you?
- (13) What
- (13) were you being told when you were asked to do an unbiased
- (14) study?
- (15) A We were told to – again do it in such a way that there
- (16) could be no question whatsoever as to how we went out and
- (17) chose
- (17) our sites because the selection of where you go to study in
- (18) any environmental project is key I could go to your yard and
- (19) do a survey of your backyard make a beeline to your kids
- (20) sandbox and conclude you lived in a desert I mean that s
- (21) what bias is in how you select your sites and we didn t want to
- (22) fall into that trap in this study
- (23) Q Did Exxon ever attempt to influence in any way your
- (24) scientific work in this case?
- (25) A No

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- (1) Q Did Exxon ask you to do an unbiased study in this case?
- (2) A Yes
- (3) Q And did you do an unbiased study in this case?
- (4) A Yes
- (5) Q And do you remain of the view that as we are here today
- (6) Prince William Sound does not have to worry about remaining
- (7) effects on plant and animal life from any remaining residue of
- (8) oil in Prince William Sound?
- (9) A Yes
- (10) MR NEAL. Your Honor could we approach the side bar
- (11) just a moment before I continue?
- (12) (Side Bar Conference off the Record)
- (13) MR NEAL. I have no further questions, Doctor thank
- (14) you very much
- (15) MR LYNCH Call Dr Jerry Neff Your Honor
- (16) THE CLERK. Would you raise your right hand please
- (17) sir
- (18) (The Witness is Sworn)
- (19) THE CLERK. Please be seated For the record sir
- (20) state your full name your address and spell your last name
- (21) please
- (22) THE WITNESS My name is Jerry Neff that s spelled
- (23) N E F F I live at 20 Templewood Drive in Duxbury
- (24) Massachusetts That s D-U-X-B-U-R Y in Massachusetts
- (25) DIRECT EXAMINATION OF DR JERRY NEFF

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- (1) BY MR LYNCH
 (2) Q Dr Neff you re currently employed as a senior research
 (3) leader at Battelle Ocean Sciences Laboratones?
 (4) A That s correct
 (5) Q That s one of the private research entities that was just
 (6) discussed with Dr Page that among other things does work for
 (7) Exxon is that correct sir?
 (8) A That is correct
 (9) Q Could you tell the jury something about Battelle Ocean
 (10) Services Laboratones? What is it?
 (11) A Battelle Ocean Sciences Laboratory is part of the Battelle
 (12) Memorial Institutes which is a private not for profit research
 (13) institute that is engaged in contract research for government
 (14) and commercial clients throughout the world Battelle has
 (15) about 8 000 employees most of them scientists in various
 (16) disciplines
 (17) Q And not for profit means that the fees you charge go to
 (18) what?
 (19) A What not for profit means is we do not have any
 (20) stockholders who have a financial interest in the company All
 (21) profits either go to charity as dictated by the will of Gordon
 (22) Battelle the founder of Battelle or to reinvest in what's
 (23) called capitalization of the laboratories That is buying new
 (24) equipment and new facilities No profits go to outside
 (25) entities

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- (1) North Carolina?
 (2) A No I went to -
 (3) Q I m sorry - correct me
 (4) A Correct that. I went on from my bachelor s degree to study
 (5) for a Ph D in zoology at Duke University in Durham North
 (6) Carolina and I was there from 1963 to 1967 when I received my
 (7) degree
 (8) Q Probably in Durham North Carolina if you go to Duke and
 (9) you re accused of going to North Carolina that s a cause for
 (10) some offense You went to North Carolina eventually though
 (11) is that correct sir?
 (12) A Yes after I received my Ph D I went to the University of
 (13) North Carolina which is just down the street and spent five
 (14) years there on the faculty at the University of North Carolina.
 (15) Q And then you went to Texas A&M?
 (16) A That is correct in 1972
 (17) Q And you stayed there until 1980?
 (18) A That is correct I was on the faculty the biology
 (19) department of Texas A&M University
 (20) Q Now while you were in Texas A&M did you do any work
 (21) related to oil spills?
 (22) A Yes Most of my research at Texas A&M University dealt
 (23) with the toxicology, aquatic toxicology of petroleum in the
 (24) marine environment that is the effects of oil on manne
 (25) organisms and manne ecosystems

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- (1) Q Dr Neff are you married?
 (2) A Yes I am I m married I ve been married for 22 years
 (3) and I have two sons, 13 and 19 years old
 (4) Q And what s your age?
 (5) A I m going to be 54 in about two weeks
 (6) Q Graduated from college in 1963?
 (7) A That is correct
 (8) Q And what did you study in college?
 (9) A I went to Antioch College in Yellow Springs Ohio where I
 (10) studied biology and received a bachelor of arts degree in
 (11) biology 1963
 (12) Q What got you interested in biology as a field of study?
 (13) A Well my hometown where I grew up in Cohasset
 (14) Massachusetts is along the coast of Massachusetts Its major
 (15) industry is lobster fishing I was an avid fisherman as a
 (16) young boy collected all my bait worms, clams and stuff, and
 (17) was always fascinated by the marine life of the shoreline of
 (18) Massachusetts which I was interested in both biologically and
 (19) gastronomically and when I got to college I seized on the
 (20) opportunity to study biology and to study these animals in more
 (21) detail in a college environment
 (22) Q That was your first interest in the food chain?
 (23) A That was my first interest in the food chain as a member of
 (24) it yes
 (25) Q And you continued studying biology at the University of

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- (1) Q What exactly did you do relating to the toxicology of oil
 (2) in the marine environment?
 (3) A We did some of the fundamental research on the toxicity of
 (4) oil and specific components of oil to marine animals from the
 (5) Gulf of Mexico and we published some of the original
 (6) quantitative work on how much oil it takes to affect a marine
 (7) animal
 (8) Q Now when you say some of the original work you mean that
 (9) you were one of the first to do research of this kind?
 (10) A Work had been done earlier but rarely had it been done
 (11) quantitatively And what I mean by that is we measured
 (12) exactly how much hydrocarbon was required and solution was
 (13) required to cause effects in aquatic organisms and we were the
 (14) first to really quantify how much was required
 (15) Q What led you to be interested in quantifying how much
 (16) hydrocarbon would cause adverse effects in living things?
 (17) A Well the problem with oil and actually it s a good
 (18) problem because it helps protect the environment oil and
 (19) water don t mix and when you mix oil and water they tend to
 (20) want to come apart right away and so in the past before we
 (21) did our studies in the early 70s people had just added oil to
 (22) water and what s called the nominal concentration but had no
 (23) idea how much oil actually remained in the water during
 (24) exposure We measured how much it was and found in fact it
 (25) was very little but at least we were able to quantify that and

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- (1) this enables us to use those results to predict the effects of
 (2) oil spills on marine organisms in the natural environment where
 (3) you don't know how much was added often
 (4) Q Dr Neff is it possible to have water in a body of water
 (5) like Prince William Sound or the Pacific Ocean or the Gulf of
 (6) Mexico that has absolutely no petroleum chemicals in it?
 (7) A Petroleum is a natural product that has been around for
 (8) hundreds of millions of years basically since the origin of
 (9) life and it seeps and gets into the ocean from various
 (10) sources both natural and human sources and in fact one of the
 (11) major sources is runoff from urban areas from cities just like
 (12) Anchorage And so almost any water sample you take
 anywhere
 (13) especially in coastal waters that's within a hundred miles of
 (14) shore or so will have traces of petroleum hydrocarbons in it.
 (15) Q Now Mr O Neill I think somewhat sarcastically asked Dr
 (16) Page if oil was good for fish Based on your training and
 (17) experiments you've done, is petroleum chemicals necessarily
 bad
 (18) for fish?
 (19) A It's not necessarily good but certainly it can be bad but
 (20) only if the concentration is high enough There are natural
 (21) concentrations or concentrations below which no effects will be
 (22) seen during lifelong exposure
 (23) Q And do we also get exposed to petroleum chemicals in our
 (24) daily life?
 (25) A We get exposed every day to petroleum chemicals When you

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- (1) go and fill your gas tank at the gas station, those vapors you
 (2) smell are benzene toluene and so forth which are major
 (3) components of gasoline We change the oil in our car we
 (4) get - we're dealing with petroleum and it gets on our skin
 (5) In many places in the past they oiled roads dirt roads
 (6) with waste diesel fuel to keep down the dust The asphalt
 (7) pavement in our driveway or the playground that our children
 (8) play on is a part of petroleum It's a petroleum product from
 (9) crude oil and so every day we come in contact with petroleum
 (10) Q Now we were talking about the period of time that you were
 (11) at Texas A&M from 1972 to 1980 After that you went into
 (12) private consulting either with A D Little and Company or
 (13) Battelle?
 (14) A Yes in 1980 I left Texas A&M University and took a
 (15) position at Battelle Ocean Sciences Laboratory in Duxbury
 (16) Q Did you continue to work in those positions in the field of
 (17) marine biology?
 (18) A Yes I did The major focus of research at Battelle and
 (19) in 1990 I went to Arthur D Little for three years both
 (20) companies is environmental assessment, that is the effects of
 (21) chemicals on marine environments and that was the focus of
 my
 (22) research
 (23) Q And are you program manager of the EPA office of marine
 and
 (24) estuarine protection task order agreement for studies relating
 (25) to the estuary program and ocean dumping?

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- (1) A I was manager of that program in the past yes
 (2) Q Previously?
 (3) A Yes
 (4) Q What is an estuary?
 (5) A Estuary is an area in the river where the river meets the
 (6) ocean It's an area where fresh water and seawater mix so
 (7) basically the mouth of an estuary the bay at the mouth of a
 (8) river and of course this is important in Prince William Sound
 (9) in Alaska because that's the area where the salmon come in and
 (10) initially enter the river The estuary stops where the water
 (11) no longer stays salty and has a low enough salt concentration
 (12) you can drink it. So by definition we say the estuary extends
 (13) from the ocean to where you can drink the water
 (14) Q How do you know where the ocean starts?
 (15) A That's obvious where the salinity approaches out of the
 (16) open ocean which is about 32 grams per liter
 (17) Q And were you technical director of the mineral management
 (18) services California monitoring program for the development of
 (19) offshore oil and gas resources?
 (20) A Yes I was
 (21) Q Your were project manager of the Department of Interior
 (22) Georges Bank benthic infauna monitoring program on the
 impact
 (23) of oil and gas explorations of the marine exploration
 (24) activities of Georges Bank?
 (25) A Yes I was

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- (1) Q What is Georges Bank?
 (2) A Georges Bank is a large sand bank off the coast of
 (3) Massachusetts and in the past has been one of the richest
 (4) fisheries areas in the Atlantic and in the world, and of
 (5) course there was concern when exploration for oil and gas
 (6) started there that that might have an adverse effect on the
 (7) environment. So we did multi year studies for the Minerals
 (8) Management Service which is a branch of the government on the
 impact
 (9) potential effects of that activity on the fisheries
 (10) Q And what are benthic infauna?
 (11) A Benthic infauna is a long name for little animals that live
 (12) in the bottom mud These are little worms and clams and so
 (13) forth, but they're very important for bottom living fish
 (14) because that's the food of these fish like cod and so forth
 (15) flounder, halibut and so forth eat large numbers of these
 (16) benthic infauna animals the little critters on the bottom
 (17) Q Did that project that you worked at Texas A&M try to
 (18) determine where to draw the line between the point where
 (19) petroleum chemicals cause problems and the point where
 they're
 (20) not causing problems?
 (21) A That is correct, yes We were trying to determine if the
 (22) drilling had any effect in the discharges which included solid
 (23) materials but also some oily materials would cause any effect
 (24) Q In referring again to the Minerals Management Service did
 (25) you work with them on a critical review of oil spill fisheries

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- (1) impact models?
- (2) A Yes I did several years ago
- (3) Q What did you do for them on that sir?
- (4) A Well an important aspect of the Minerals Management Service has a mandate to protect ocean environments from offshore oil and gas activities and to assess the potential impacts And as part of that they developed several mathematical models that would predict the interaction of an oil spill or other accidental event on fisheries species and they have several of these models as I say that they've contracted for over the years and I was asked to review the toxicological aspects of those models to evaluate whether they might provide accurate predictions of the effects of a spill in fisheries species so the toxicological aspects of course are the effects of the oil in the water on the fish or on their food
- (17) Q Did the Australian Petroleum Exploration Association have an environmental review committee?
- (18) A Yes it did and I was the single non Australian member of that environmental review committee
- (21) Q And what did that work involve?
- (22) A We were asked to commission a review of the scientific literature to produce a book dealing with the effects of offshore oil and gas development on the marine environment of Australia and we produced a book a 600-page book that was

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- (1) published in January 1994 dealing with that subject
- (2) Q And were you on the research and development monitoring subcommittee of the federal committee on offshore pollution?
- (4) A Yes I was
- (5) Q And are you on the mineral management service outer continental shelf advisory boards scientific committee?
- (7) A Yes I'm currently on that committee
- (8) Q We're going to - we're going to give a plug to your book
- (9) Are you the author of that perennial favorite polycyclic aromatic hydrocarbons in the aquatic environment sources, fates and biological effects Sounds like a real -
- (12) A It's a real best seller Yes I published that book in 1979 and as a matter of fact it was the standard reference book in that area for more than 10 years That's a very esoteric area but it deals directly with the effects of oil pollution on marine environments
- (17) Q It's like herring eggs on kelp there are some people who like that stuff?
- (19) A That's right and some people who don't
- (20) Q And did you also publish responses of marine animals to specific petroleum hydrocarbons?
- (22) A Yes I did I published that book in 1981
- (23) Q And then the book you mentioned a few minutes ago arriving from your Australian work?
- (24) A That is correct

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- (1) Q Is this the totality of your writings?
- (2) A No I have approximately 110 scientific publications in peer review journals or symposium volumes et cetera most of those deal with the effects of pollution on marine environments
- (6) Q Dr Neff you indicated earlier that - do these articles include the work that you did at Texas A&M that was sort of the original work in trying to define the level at which petroleum chemicals may cause problems for marine animals?
- (10) A Yes that original work was published in 1974 in the Journal of Marine Biology which is a very prestigious journal and has been the most cited article on that - in marine biology in the last several years So it was widely accepted widely used widely copied and this was the original work
- (15) Q Now apart from the Exxon Valdez spill have you had any involvement in other oil spills in your professional career?
- (17) A Yes I've studied several other oil spills throughout the world
- (19) Q By the way I see you're sitting there with your hands crossed is that because a media consultant told you to?
- (21) A No no one ever told me to do it that way it's just the chair is too high
- (23) Q I don't want you to feel uncomfortable if that's the way you feel comfortable even though the media consultants say it you can sit that way What oil spills have you worked on?

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- (1) A Perhaps the biggest one is the Amoco Cadiz spill, which I think everyone has heard about many times here and I severed a
- (3) contract from the National Oceanic Atmospheric Administration to study the effects of the Amoco Cadiz spill on oyster resources and commercial fish resources The fish I studied is a plaice it's similar to a flounder
- (7) Q Could you spell that so we'll be able to look -
- (8) A Plaice it's P L A I C E And anyway it's a flat fish fairly minor commercial value but it lives in shallow estuaries and some of the estuaries were very heavily contaminated with oil after the spill right downstream within a few miles of the wreck of the tanker Amoco Cadiz And by the way Amoco Cadiz actually released six times more oil than was released by the Exxon Valdez so this was one of the biggest spills at the time in the world
- (16) Q Was it a remote site?
- (17) A No In fact it's a very heavily inhabited site The Brittany coast of France has been inhabited since thousands of years It's a very important cultural area in France It's a major source of fisheries for all of France Most of the fish from Brittany go to the fish markets in Paris and they have major maniculture industries for oysters and crabs and shrimp plus offshore commercial fisheries for a wide variety of different fish species so it was right in the middle of an important fishery area that this spill occurred

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- (1) Q And your work on the Amoco Cadiz did that involve
 (2) evaluating the toxicological effects of oil after it's gotten
 (3) into seawater?
 (4) A Yes it did
 (5) Q What other oil spills if any have you worked on?
 (6) A There have been several A lot of small spills one in
 (7) Texas in the late 1970s crude oil spill into salt marshes and
 (8) we were asked by Exxon in that case to study the effects on
 (9) shrimp in the estuaries A spill in fresh water in the
 (10) Monongahela River and there was concern about damage to
 (11) the
 (12) drinking water supplies and the Ohio River the Monongahela
 (13) flows into the Ohio and the Ohio is used for drinking water by
 (14) the people of Ohio and Kentucky, so we evaluated that.
 (15) Larger spills more recently I was the Italian - I
 (16) assisted the Italian government and scientists to study the
 (17) Haven oil spill off Genoa, Italy, and again this is a major
 (18) fishery area for Italy in the northern Mediterranean Sea And
 (19) I assisted the Italian government and marine scientists in
 (20) Italy to investigate the effects of that spill in commercial
 (21) fisheries off Genoa Italy
 (22) Just recently in February I was asked by the government of
 (23) the United Arab Emirates to investigate a spill in the Straits
 (24) of Hormuz You probably heard that during the Gulf War
 (25) That's the narrow area between the Arabian Gulf where we get
 (26) most of our middle eastern oil And there was a big spill and

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- (1) the government of United Arab Emirates asked me to
 (2) investigate
 (3) the effects of that spill on fisheries in the Emirate of
 (4) Fujairah which is a very poor emirate relies heavily on
 (5) fishery products
 (6) Right now I'm in the study of an unusual spill it was a
 (7) blowout near Milan Italy into rice fields and we're studying
 (8) effects of that blowout on the rice crops and wildlife
 (9) There's a national park right near and there's oil spilled on
 (10) the rice crops and the wildlife living in the natural park in
 (11) the area
 (12) Q Have you had an occasion to study an oil spill in arctic or
 (13) subarctic conditions prior to the Exxon Valdez?
 (14) A I was part of the experimental oil spill called the bio
 (15) study and this was north shore of Bathurst Island, that's about
 (16) as far north as you can get. It's in northern Canada, and that
 (17) investigation was to determine the effects of crude oil and
 (18) chemically dispersed crude oil on nearshore arctic
 (19) environments, and I was - again I received sponsorship from
 (20) the National Oceanic and Atmospheric Administration to study
 (21) the effects of that oil spill that experimental oil spill on
 (22) marine clams
 (23) Q Now you've been involved in either the academic field or
 (24) private consulting investigation of the effects of oil on the
 (25) environment for at least 20 years correct?
 (26) A That is correct yes

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- (1) Q And you get paid for that?
 (2) A That's right I receive a salary
 (3) Q And you need to also buy materials and travel and those
 (4) things to do that study correct?
 (5) A That is correct.
 (6) Q Are those kinds of studies funded year in and year out by
 (7) fishermen?
 (8) A Not most of them Fishermen have supported studies of that
 (9) type but most of the funding comes from either the commercial
 (10) side or from government
 (11) Q The commercial side being the industries that produce and
 (12) transport oil?
 (13) A Organizations like American Petroleum Institute or
 (14) Australian Petroleum Exploration yes
 (15) MR LYNCH Your Honor I would tender Dr Neff as an
 (16) expert in marine biology particular emphasis on the adverse
 (17) effects of spilled oil on marine life the evaluation of
 (18) harmful potential of petroleum chemicals contained in marine
 (19) waters
 (20) MR O NEILL We have no objection
 (21) THE COURT Thank you the witness' qualifications are
 (22) accepted by the Court.
 (23) BY MR LYNCH
 (24) Q Let me ask you first off Dr Neff to sum up what you know
 (25) about the world's experience with major oil spills including

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- (1) the Amoco Cadiz spill that was six times the size of the Exxon
 (2) Valdez spill, and the spills that you have personally been
 (3) involved in and that you know from the literature What is -
 (4) what has world historical experience told us about the likely
 (5) effect of a major marine oil spill on fish populations?
 (6) A Okay, one of the immediate concerns after any oil spill is
 (7) the potential impact on commercial fisheries because that's
 (8) the major economic value of the oceans and coastal waters and
 (9) so perhaps that's been one of the most studied aspects of oil
 (10) spills recorded in recent history and there have been a great
 (11) many studies of oil spills, of the effects of oil spills and to
 (12) my knowledge there's never been a report of a major impact of
 (13) an oil spill, even oil spills much larger than Exxon Valdez on
 (14) any commercial fishery for a sustained length of time
 (15) Q Now when you say major impact, you mean there haven't
 (16) been
 (17) instances where there have been large losses of fish income or
 (18) fish harvest?
 (19) A There have been small fish kills usually representing a
 (20) very small fraction of the fish and few fish floating up to the
 (21) surface or something like that. This does not have an impact
 (22) on the fishery I'm not saying that there weren't fish killed
 (23) by oil spills in the past or even by Exxon Valdez That does
 (24) happen, regrettably However at the population level that is
 (25) the level at which we harvest these fish commercially there's
 (26) never been a substantial impact

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- (1) Now in many cases there are fishery closures as happened
 (2) in Prince William Sound or there's a reluctance on the part of
 (3) fishermen to fish in the area because they might contaminate
 (4) their nets and so forth and that happened after the Genoa
 (5) spill the Haven spill off Genoa. So there are impacts because
 (6) of either reluctance or prohibition of fishing but usually when
 (7) the fishermen are able to go back the fish are there and the
 (8) fisheries the harvests are good and have not been
 (9) significantly affected by the spill
 (10) Q Dr Neff let me show you DX5355 B for identification
 (11) A Okay this is the results of some toxicity tests done at
 (12) the Auke Bay laboratory near Juneau Alaska and it shows
 (13) what's called the lethal toxicity of petroleum measured as
 (14) aromatic hydrocarbons to pink salmon adults. Now when we
 (15) try
 (16) to measure the toxicity of oil or other chemicals to a fish we
 (17) usually expose them to several concentrations and measure the
 (18) concentration in which half the animals die or half survive
 (19) the glass is half full or half empty but there's a 50 percent
 (20) response that's got the median lethal response or LC 50
 (21) In this case we see the median lethal response after four
 (22) days or 96 hours of adult salmon was in the range of 1 000 to
 (23) approximately 1700 parts per billion. So that's a fairly large
 (24) amount of oil in water to cause that effect
 (25) Q Let me ask you a few questions about this chart. First of
 (26) all in the bottom it refers to Rice NOAA to Rice NOAA I

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- (1) think it is and Rice to NOAA. This is not something you did?
 (2) A That's correct
 (3) Q You know who Dr Rice is or Mr Rice is?
 (4) A I know him very well. He's probably one of the other
 (5) foremost experts of aquatic toxicology in the world and he
 (6) works at the Auke Bay laboratory just outside Juneau Alaska
 (7) Q Has he concentrated on the fish species common to Alaska?
 (8) A Yes that's why his data is so important. He's focused on
 (9) crude oils from Alaska and native species to Alaska in fish and
 (10) invertebrates
 (11) Q Now you described the work you initially did at Texas A&M
 (12) and published and that's an opinion read and followed by
 (13) other
 (14) scientists and as I understand from what you said the
 (15) technique the first part of the technique is to find the level
 (16) of petroleum chemicals that will cause a number of fish to die
 (17) within a specified time?
 (18) A That is correct
 (19) Q And that's called the median lethal level?
 (20) A That's right
 (21) Q And that gives you a way of knowing how much chemical in
 (22) the water will actually cause the death of the animals?
 (23) A That is correct
 (24) Q What use is made of that information once it's been
 (25) ascertained?
 (26) A That information alone is hard to interpret in terms of

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- (1) environmental effects of an oil spill and so we usually will
 (2) virtually always try to collect additional information that is
 (3) on the concentrations of petroleum in the water that might
 (4) cause other effects less than mortality. In other words
 (5) changes in growth rates what are called sublethal or chronic
 (6) effects. Chronic just means long term exposure. Sublethal
 (7) means an effect that's less than the death of the animal. And
 (8) we need to find out this information because we're just not
 (9) concerned whether fish are killed we're concerned whether
 (10) their life is impaired in any way in the environment
 (11) MR LYNCH Your Honor I'd offer 5355-B
 (12) (Exhibit 5355 B offered)
 (13) MR O NEILL. No objection
 (14) THE COURT Defendants Exhibit 5355-B is admitted
 (15) (Exhibit 5355-B received)
 (16) BY MR LYNCH
 (17) Q Let me show you DX5328-Baker Dr Neff and ask you if you
 (18) would just briefly describe what this chart depicts?
 (19) A I just mentioned the chronic toxicity and these are the
 (20) results of some chronic toxicity tests on pink salmon. In this
 (21) case the investigators again from the Auke Bay laboratory
 (22) studied juveniles and fry of pink salmon and studied the effect
 (23) of oil on growth rate and on restoration in these animals and
 (24) showed that it required 400 parts per billion to reduce the
 (25) growth rate or to increase restoration. These exposures were

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- (1) for approximately 40 days at least in one instance there for
 (2) the juveniles. So that's considered a chronic exposure
 (3) That's probably longer than any fish would be exposed in the
 (4) environment but it represents a long term exposure causing
 (5) sublethal effects that has reduced growth rate
 (6) Q So the first chart tells us that according to these
 (7) experiments something like a thousand parts per billion is
 (8) that correct?
 (9) A That is correct
 (10) Q That would be a thousand drops in a swimming pool?
 (11) A Something like that yes
 (12) Q To use Dr Jahns measurement?
 (13) A Uh huh
 (14) Q And that would result in death to the animals at least to
 (15) a number of them?
 (16) A That's right
 (17) Q And what you're trying to determine here is some kind of
 (18) other impact less than death some kind of impairment or -
 (19) A Yes what the chronic toxicity tests are trying to
 (20) determine is what is the lowest concentration that will cause
 (21) an effect and by logical inference what is the lowest - the
 (22) highest concentration that will not cause any effect even
 (23) during lifetime exposure. These chronic tests are designed to
 (24) find that interface where oil begins to have an effect and
 (25) below which there is no effect of the oil

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- (1) MR LYNCH Your Honor I'll offer 5328-Baker
 (2) (Exhibit 5328-B offered)
 (3) MR O NEILL No objection
 (4) THE COURT Defendants s Exhibit 5328 B is admitted
 (5) (Exhibit 5328 B received)
 (6) BY MR LYNCH
 (7) Q Is there a use for this information apart from oil spills
 (8) this information about where the so-called interface is?
 (9) A That s extremely important information for environmental
 (10) protection because then we can establish what levels of
 (11) discharges from permitted - permitted effluents should be
 (12) allowed We can determine whether - you might say the safety
 (13) factor If we have a discharge of any waste material
 (14) containing oil what is the safety factor how much below the
 (15) concentration that might cause an impact there is
 (16) We can use this for regulatory purposes or for evaluating
 (17) risks of aquatic marine organisms to routine activities human
 (18) activities
 (19) Q Has this type of scientific research been used relied on
 (20) by government in setting standards when to say for example if
 (21) I'm running a hotel on the shore of Prince William Sound how
 (22) much runoff from my property can be regarded as safe without
 (23) posing a threat to the environment?
 (24) A That is true yes
 (25) Q Let me show you Exhibit DX5356-Baker and is this a similar

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- (1) chart showing the level at which petroleum chemicals aromatic
 (2) petroleum chemicals will lead to death in Pacific herring
 (3) adults?
 (4) A Yes it is and this graph shows that again in
 (5) experiments done at the Auke Bay laboratory that anywhere
 (6) between 1200 and 2200 parts per billion total aromatic
 (7) hydrocarbons in water will cause 50 percent mortality in adult
 (8) herring
 (9) Q This is Dr Rice s work again?
 (10) A That s correct.
 (11) MR LYNCH Your Honor offer 5356-Baker,
 (12) DX5356 Baker
 (13) (Exhibits 5356-B offered)
 (14) MR O NEILL No objection
 (15) THE COURT The exhibit is admitted
 (16) (Exhibit 5356 B received)
 (17) BY MR LYNCH
 (18) Q Next chart is 5377 Alpha, DX5377 Alpha relating to Pacific
 (19) herring chronic toxicity, and without reviewing what the chart
 (20) says since I think we can all read it and got the hang now of
 (21) what you're talking about, is this some further research that
 (22) Dr Rice has done indicating the lower level at which adverse
 (23) effects begin to be seen in Pacific herring?
 (24) A That is correct yes
 (25) MR LYNCH Offer 5377-Alpha, Your Honor

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- (1) (Exhibit 5377 A offered)
 (2) MR O NEILL No objection
 (3) THE COURT Defendants Exhibit 5377 A is admitted
 (4) (Exhibit 5377 A received)
 (5) BY MR LYNCH
 (6) Q Let me ask you to address DX1957 Alpha Dr Neff
 (7) A Okay this is a summary of several experiments with herring
 (8) eggs and often the eggs are considered very sensitive
 (9) However Rice s group showed that to cause direct mortalities
 (10) in the eggs requires about 1500 parts per billion aromatics
 (11) from petroleum However a variety of what is called sublethal
 (12) or chronic effects may be produced at much lower
 (13) concentrations and Dr Pearson who you'll hear later on found
 (14) that exposure of herring eggs for 24 hours to 40 parts per
 (15) billion caused increased levels of abnormal - numbers of
 (16) abnormal larvae That was the lowest concentration that
 (17) caused
 (18) any abnormal larvae
 (19) Dr Kocan who you heard the other day did other
 (20) experiments and he found about as low as 20 parts per billion
 (21) he could see some evidence of chromosomal damage in some
 (22) of the
 (23) eggs
 (24) Q In his study that occurred after continuous exposure for
 (25) what?
 (26) A That was continuous 18 day exposure to water soluble
 (27) fraction oil and water mixtures that were renewed every two

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- (1) days during the 18 days yes
 (2) MR LYNCH Offer DX1957 Alpha Your Honor
 (3) (Exhibit 1957-A offered)
 (4) MR O NEILL No objection
 (5) THE COURT The exhibit is admitted
 (6) (Exhibit 1957-A received)
 (7) BY MR LYNCH
 (8) Q Let me refer you to Exhibit DX5658 Baker Dr Neff Could
 (9) you describe for the record what this chart depicts?
 (10) A Okay, the U S Environmental Protection Agency in its
 (11) effort to protect marine waters and fresh waters for wildlife
 (12) and for fish and wildlife and so forth and for propagation of
 (13) fish and so forth sets water quality criteria and this is a
 (14) summary of marine water quality criteria for three of the most
 (15) important components of crude oil, these are benzene toluene
 (16) and ethyl benzenes and we'll be referring to those later as
 (17) VOAs or volatile aromatic compounds but the criteria for
 (18) benzene is 700 parts per billion Remember benzene is that
 (19) smell you smell when you're pumping gas at the gas station
 (20) and
 (21) smell the vapors that s mostly benzene
 (22) Toluene is the other component of gasoline and the
 (23) criterion value there is 5 300 And ethyl benzene is about
 (24) 430, and that means as long as those aren't exceeded in the
 (25) water column, fish and other water life is protected that is
 (26) they're not harmed at all by the exposure to these

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- (1) concentrations
 (2) Q Now these VOAs those are the very highest or very
 (3) lightest components of crude oil?
 (4) A That is correct
 (5) Q Now how is it that we only look at these aromatic
 (6) components of crude oil? What about the ones further down
 (7) the
 (8) barrel?
 (9) A Well there s been a tremendous amount of research done to
 (10) identify what components of petroleum are toxics They re not
 (11) all toxic Not everything in the world is toxic and the work
 (12) from my laboratory when I was at Texas A&M and the work of
 (13) Stan
 (14) Rice and his group at Auke Bay and other investigators have
 (15) shown quite convincingly that it s the aromatic hydrocarbons in
 (16) oil that cause virtually all the toxicity and we can relate or
 (17) correlate the toxicity of any crude or refined oil to the
 (18) relative amount of aromatic hydrocarbons in the oil
 (19) Q So it s a little bit like my cough medicine bottle it
 (20) talks about an active ingredient and then -
 (21) A That s right and the active ingredients in oil with
 (22) respect to fish are the aromatic hydrocarbons
 (23) Q In terms of the danger they could pose to fish?
 (24) A In terms of interaction yes
 (25) Q Why do we differentiate between VOAs and polycyclic
 aromatic hydrocarbons?
 A The main one is analytical We measure them a different

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- (1) way and the main reason is VOAs are volatile they evaporate
 (2) very easily If you put a glass of benzene out here on the
 (3) table and it had half an inch of benzene in it within half an
 (4) hour all that benzene would be gone it would be up in the air
 (5) in the vapor phase It would have evaporated just like if you
 (6) left a bottle of scotch open or a glass of scotch open and left
 (7) it out on the counter for a day or so it wouldn t be scotch
 (8) anymore the next day All the alcohol would be gone It s
 (9) evaporated into the air and so we call these volatile
 (10) compounds and those are the benzene toluene and xylene
 (11) and
 (12) so forth
 (13) The polycyclic aromatic hydrocarbons these compounds are
 (14) composed of one ring six carbons linked together in a nice
 (15) little ring a hexagon The polycyclic aromatic hydrocarbons
 (16) as the name implies there are two or more rings polycyclic
 (17) many cycles or circles These are less volatile They tend to
 (18) not evaporate quickly but they are important components of
 (19) petroleum and as I ve already indicated contribute to the
 (20) toxicity of oil because they do go into solution to a slight
 (21) degree
 (22) Q Well you just sort of anticipated my next question
 (23) You ve told us how they interact with air How do they
 (24) interact with seawater these two types?
 (25) A The volatile compounds like benzene are moderately
 soluble That is if you put benzene in water a little bit

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- (1) will go into solution but it much prefers to be in the air
 (2) So its you might say affinity or avidity for the water is
 (3) only 1 100th of its preference to go into the air but it will
 (4) dissolve
 (5) For the polycyclic aromatic hydrocarbons they re slightly
 (6) soluble just a little bit will go into the water if they re
 (7) mixed water for a long enough period of time
 (8) Q Now you referred to something I hadn t heard you say
 (9) before to the fact that if you leave a glass of scotch out for
 (10) a while it ll lose its kick If you have benzene dissolved in
 (11) seawater will it stay in the seawater once it s dissolved in
 (12) solution?
 (13) A Just like the glass of scotch it ll lose its kick It ll
 (14) all go into the air and evaporate and go away
 (15) Q If benzene were to go into solution what is the probable
 (16) sequence of events there?
 (17) A Well say after an oil slick some of the benzene from the
 (18) slick will go into solution in the water Most will go up into
 (19) the air and evaporate right away within a day or so but a
 (20) small amount will go into the water but as soon as it does it
 (21) wants to get out of the water and it will evaporate from the
 (22) water almost as quickly as it goes into solution
 (23) MR LYNCH Let met show you DX5657 I believe this
 (24) has been offered Your Honor but if it hasn t been I ll offer
 (25) it

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- (1) (Exhibit 5657 offered)
 (2) THE WITNESS Okay The U S -
 (3) THE COURT Wait a minute
 (4) THE WITNESS I m sorry
 (5) MR O NEILL No objection
 (6) THE COURT 5657 is admitted if it hasn t already
 (7) been
 (8) (Exhibit 5657 received)
 (9) THE WITNESS Sorry for that The federal government
 (10) for that also has tried to develop a criterion for totally
 (11) polycyclic aromatic hydrocarbons Let s call them PAHs Their
 (12) criterion is acute criterion I mean this concentration can t
 (13) be exceeded even for a single spike and that concentration is
 (14) 300 parts per billion total PAH However the State of
 (15) Alaska - most states develop - develop their own criteria
 (16) which now are called standards because they re water quality
 (17) standards for the local users of the state and each state is
 (18) asked to do that and they re asked to use the federal water
 (19) quality criteria but to develop their own standards based on
 (20) best practices and uses of the water in the State
 (21) The State of Alaska in 1979 developed a standard for
 (22) total aromatic hydrocarbons in water That standard is ten
 (23) parts per billion That s the most conservative standard in
 (24) the whole country That means there s no criterion or standard
 (25) lower than that anywhere else in the country This is the most

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- (1) conservative one anywhere
 (2) Q So the Alaska standard of ten parts per billion says that
 (3) if there are ten drops of either VOAs or PAHs in a sample of
 (4) water the size of a swimming pool that that water is
 (5) nevertheless safe in the judgment of the State of Alaska for
 (6) living things fish and clams and mussels and the little
 (7) critters that fish and clams and mussels eat?
 (8) A That is correct. As long as the concentration doesn't
 (9) exceed 10 then everything's safe and the State has said that
 (10) that is a safe concentration
 (11) Q And compared to the scientific research that Dr. Rice has
 (12) done that you've done that others have done that accomplish
 (13) levels at which harm starts to occur how does that ten parts
 (14) per billion match up? Is that pushing the lower limit of harm?
 (15) A No that's much lower than the concentrations at which we
 (16) see effects and the reason for that is the State has applied
 (17) what's called the safety factor. They want to be absolutely
 (18) sure that no critter even the ones that were exposed in the
 (19) laboratory will be protected will be safe. It's a very
 (20) conservative number.
 (21) Q I think you may have misspoken yourself and just to try to
 (22) straighten out they try to concern themselves that no critter
 (23) will be safe?
 (24) A Oh that every critter will be safe. I'm sorry.
 (25) MR LYNCH I may have misheard you. Offer 5657

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- (1) THE COURT We did that.
 (2) MR LYNCH Have I done that already?
 (3) THE COURT At least once.
 (4) MR LYNCH I'm nervous about overlooking it.
 (5) BY MR LYNCH
 (6) Q Now Dr. Neff you were hired to begin working on the Exxon
 (7) Valdez oil spill in late March of 1989?
 (8) A Yes I got a telephone call on the 27th or 28th and was in
 (9) Valdez on the 29th.
 (10) Q Okay Now I'd like to ask you a few questions
 (11) preceding - about the spill and what you know about the spill
 (12) preceding your arrival in Valdez on March 29. The record up to
 (13) this point indicates that the spill occurred about 10 minutes
 (14) after midnight on March 24, 1989 and that between that time
 (15) and
 (16) the following Sunday March 26th the spilled oil remained in a
 (17) fairly cohesive slick in the vicinity of the vessel and that
 (18) conditions were calm. And is that your understanding from -
 (19) from the information that you looked into?
 (20) A Yes that is correct.
 (21) Q Based on your research your knowledge of -
 (22) THE COURT We have a technical problem. We'll fix it
 (23) in just a second if you'd stand by, please.
 (24) (Off the record)
 (25) BY MR LYNCH
 (26) Q Dr. Neff Mr. Cooper was concerned that my analogy about

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- (1) drops in the swimming pool might be understood as referring to
 (2) drops of oil. The drops would be drops of the active
 (3) ingredient?
 (4) A That's right.
 (5) Q And the standards would be the amount of that ingredient
 (6) that was dissolved into the water?
 (7) A That is correct.
 (8) Q So for example if you dropped a drop of benzene in the
 (9) water and some of it evaporated you might have more of that
 (10) then?
 (11) A That's right.
 (12) Q Now I was asking you about the state of the oil spill from
 (13) the time of the accident on the morning of March 24 until the
 (14) storm that occurred that following Sunday. At that time did
 (15) the oil from the Exxon Valdez represent a threat to the safety
 (16) of fish to the viability of fish?
 (17) A During that time the weather was relatively calm as you
 (18) said and so the oil spread mostly by gravity. It just spread
 (19) flushing away from the tanker and covered a fairly small area
 (20) of upper Prince William Sound basically southwest of Bligh
 (21) Reef.
 (22) At that time of year late March there are no salmon in
 (23) Prince William Sound at least in the water column offshore.
 (24) There are a few in the streams but they're in the gravel and
 (25) far away from the oil spill. So the salmon would not be

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- (1) potentially affected.
 (2) Let me go back a minute even though there was not much
 (3) mixing because the weather was calm there - probably some
 (4) hydrocarbons got into the water column and -
 (5) Q And when you say hydrocarbons you mean aromatic -
 (6) A Petroleum aromatics yes hydrocarbons and some would
 (7) have
 (8) dissolved from underneath the slick that was coming out of the
 (9) tanker and some would be in the form of little oil droplets
 (10) that were pushed down into the water and then tended to go
 (11) back
 (12) up to the surface and so most - to the extent that
 (13) hydrocarbons were in the water column or aromatic
 (14) hydrocarbons,
 (15) most would be up near the slick near the water surface and
 (16) there would be very little a greater depth down into the water
 (17) column.
 (18) We don't know where herring are until they arrive on shore
 (19) to spawn but the general feeling at that time of year they
 (20) probably would have been in their - just beginning to come out
 (21) of the wintering areas which we think may be in the Montague
 (22) Straits well south of the spill site or well west of Naked
 (23) Island. So it's unlikely there would be significant numbers of
 (24) herring in the spill area in those few days and if they were
 (25) there, herring don't feed in the month or so before they spawn
 (26) so they probably would have been in deep water because they
 (27) stay in deep water except to come up to feed to protect them
 (28) from predators. Almost everybody out there loves herring for

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- (1) dinner They stay in the area of deep water and they would not
 (2) have been exposed
 (3) My feeling is that in those days immediately after the
 (4) spill probably very few fish of commercial value were in the
 (5) area and could have been exposed if there were significant
 (6) hydrocarbon concentrations in the water column
 (7) Q Now let me just focus on the part of your answer that
 (8) relates to the - to the spacial territory where you think
 (9) there may have been concentrations of petroleum - aromatic
 (10) petroleum chemicals sufficient to cause harm to fish or other
 (11) living things That would have been immediately under and
 (12) probably a little to the side of the slick itself?
 (13) A For the most part immediately under the slick in that time
 (14) frame yes because there wasn't much mixing and the currents
 (15) were pushing the oil so the oil under the slick would move the
 (16) oil itself
 (17) Q How far down into the water would you expect the
 (18) concentrations to be?
 (19) A In that time -
 (20) Q In levels of concern?
 (21) A At that time frame they may be of concern or not We
 (22) don't know the actual numbers but probably 10 to 20 feet
 (23) below
 (24) the water surface you might get slightly elevated concentration
 (25) of hydrocarbon but it's doubtful it would be deeper than about
 (26) 10 to 20 feet below the surface

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- (1) Q On Sunday - this is also prior to your arrival correct?
 (2) A That is correct
 (3) Q On Sunday there was a big storm and that as we've heard
 (4) blew the slick out and broke it up into smaller agglomerations
 (5) of oil What would be the chemical properties of the oil
 (6) vis a vis marine biology subsequent to the storm?
 (7) A Okay the storm obviously provided a lot of wave action
 (8) that would have broken the slick up into many smaller slicks
 (9) and what are called streamers which are long thin slicks
 (10) mixed water with the oil and mixed oil with water and what you
 (11) would have during and immediately after the storm would be
 (12) small slicks spread around in different areas spread over a
 (13) much larger area in the water column Under them you would
 (14) have some hydrocarbons both in the form of small droplets of
 (15) oil that had broken off the slick and forced down into the
 (16) water and some dissolved hydrocarbons in the upper water
 (17) column perhaps the upper 30 feet or so you would have both
 (18) dissolved and what is called dispersed oil That's droplets of
 (19) oil suspended in the water
 (20) Q So if I understand that answer I was a little distracted
 (21) by getting the chart put up as the oil slick is broken up into
 (22) a lot of smaller puddles of oil on top of the water you think
 (23) there would have been more mixing?
 (24) A Yes definitely there would have been
 (25) Q That would have caused little droplets to become
 (26) commingled

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- (1) into the water?
 (2) A That is right.
 (3) Q And the presence of those droplets would raise the level of
 (4) chemicals that could be harmful?
 (5) A That is correct
 (6) Q And you also believe there would be some solution or
 (7) dissolution of the chemicals into the water?
 (8) A That is correct yes
 (9) Q As opposed to all being gathered in one big continuous
 (10) territory it would be associated with the place where the oil
 (11) was still?
 (12) A Pretty much and it would be in little patches here and
 (13) there where the oil still was congregated on the surface
 (14) Q Now we talked - whether or not the analogy works we
 (15) talked about the fact that a part per billion is if you could
 (16) take a tablet say, of this and mix it into a swimming pool
 (17) that would give you - that's equal to a drop it would equal a
 (18) part per billion?
 (19) A That's right.
 (20) Q Do you know approximately how far from the oil how far in
 (21) feet would you go before you got down into the level of parts
 (22) per billion?
 (23) A As I just indicated right near the surface and again
 (24) during the storm and immediately after you'd have much
 (25) higher
 (26) concentrations but the concentration would tend to decrease

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- (1) with depth below the surface slicks and so forth and the wave
 (2) action - and this has been shown in other spills both
 (3) experimental and real spills and by 30 feet or so you would
 (4) be getting down to very low concentrations
 (5) Q In your opinion as the slick broke up and formed these
 (6) mini slicks or mini puddles around the Sound did they - did
 (7) those - did that dispersed oil or scattered oil represent a
 (8) significant risk to commercial species of fish in Prince
 (9) William Sound?
 (10) A Again the salmon weren't there so they weren't at risk
 (11) The herring as I say were mostly in deeper water outside the
 (12) main spill path in that time frame So I think for the most
 (13) part they were out of danger you might say from significant
 (14) water column exposure
 (15) The oil on the surface again never during that time
 (16) represented a threat to the fish It's what gets down into the
 (17) water column where the fish live that could cause a problem
 (18) Q Now beginning after your arrival in March - on March 29
 (19) 1989 you were involved in a program to actually measure the
 (20) levels of petroleum chemicals that were to be found in the
 (21) water areas?
 (22) A That is correct yes
 (23) Q Let me show you Exhibit DX8646 Alpha Does this exhibit
 (24) summarize the water quality assessment program in which you
 (25) were involved beginning on March 29 1989?

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- (1) A This summarizes the sum total of all the water quality
 (2) measurements that we took between 1989 about 1991
 throughout
 (3) Prince William Sound in areas where the oil was known to go
 (4) That's oil spill path areas so it's called oiled areas here
 (5) What we see is there are nine different studies involving water
 (6) quality samples and we sampled at 236 locations in Prince
 (7) William Sound alone We sampled additional locations outside
 (8) the Sound and we took more than 2400 samples for water
 quality
 (9) measurements This is by far the largest water quality program
 (10) performed after any oil spill large or small
 (11) MR LYNCH Your Honor if Dr Neff could step to this
 (12) chart here and just give us a general idea of where the 236
 (13) locations for checking the water would be While he's doing
 (14) that I'll offer 8656-Alpha
 (15) (Exhibit 8656-A offered)
 (16) MR O NEILL No objection
 (17) THE COURT Defendants Exhibit 8656-A is admitted
 (18) (Exhibit 8656-A received)
 (19) THE WITNESS This is a rather beautiful Landsat
 (20) photograph from a satellite flying over Prince William Sound on
 (21) April 7th 1989 and fortunately the weather was very good at
 (22) that -
 (23) MR LYNCH Step over here You're blocking His
 (24) Honor's view
 (25) THE WITNESS The weather was very good that day We

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- (1) have a clear picture of the Prince William Sound The actual
 (2) tanker accident occurred up here in the corner It's off the
 (3) map put the spill the oil moved down through the central
 (4) Sound around Naked Island group and we'll be talking about
 (5) Naked Island later and down through Montague Pass and
 down
 (6) through the islands in the eastern Sound This is Knight
 (7) Island group here seen in real life rather than a map and
 (8) down through all these islands here LaTouche Island Elrington
 (9) Island Evans Island so forth, eventually out into the Gulf of
 (10) Alaska.
 (11) Now these red blobs that look like modern art that's
 (12) actually oil on the water surface This was April 7th We
 (13) picked this date because this is just before the beginning of
 (14) spawning of herring in Prince William Sound and the herring
 (15) spawn up here There was some spawned on the northern part
 of
 (16) Montague Island up in Tattiek Narrows out off the map here
 and
 (17) around Naked Island and you can see there are a few red dots
 in
 (18) this area here representing oil slicks so some oil in this
 (19) area and lots of oil down here and you can see that it's
 (20) broken up into narrow strands and so forth
 (21) So our sampling locations extended from near the tanker up
 (22) here but throughout this area around these islands like Naked
 (23) Island We had some samples up around Montague the
 northern
 (24) interior of Montague Island around Green Island and many
 (25) samples around the Knight Island group because that's where

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- (1) most of the oil went and samples down here in all the passes
 (2) where the oil exited and basically throughout the area through
 (3) which the oil passed we had sampling locations where we went
 (4) and sampled at different times after the spill to determine the
 (5) water quality how much oil was in the water column
 (6) Q You've given us a top down or a flat view of where the
 (7) sampling locations were What about depth in the water?
 (8) A Well most of the biological life in the water column of a
 (9) deep fiord like Prince William Sound occurs in the upper
 (10) hundred feet or so It's not spread throughout the water
 (11) column from the surface to the bottom and likewise most of
 (12) the oil that gets into the water is not spread throughout the
 (13) water column
 (14) So most of our samples are taken near the water surface
 (15) where most of the biological activity occurs in Prince
 (16) William Sound and other oceanic environments the food chain
 is
 (17) based on microscopic plants that have to live in the upper
 (18) water layers where the sunlight penetrates and everything else
 (19) that depends on them lives up there too So we are sampling
 (20) locations that are just below the water surface at about three
 (21) feet below the water surface nine feet and as deep as about a
 (22) hundred feet below the water surface for the most part We
 (23) did take deeper samples
 (24) Q In the nature of things when you're dealing with petroleum
 (25) chemicals that get into seawater where would you expect to

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- (1) find concentrations, if they did exist?
 (2) A We would expect the highest concentrations to be in the
 (3) near surface waters and lower concentrations to be in the
 (4) deeper areas of the water column That's why we focused our
 (5) sampling in the upper layers of the water column to get the
 (6) deepest concentrations
 (7) Q You began taking samples in early April of 1989?
 (8) A That is - well our first samples are actually the end of
 (9) March March 30th
 (10) Q Even before April?
 (11) A Yes
 (12) Q At that time, there was as this picture shows there was
 (13) still oil on top of the water to be seen from a satellite photo
 (14) and I suppose if you got closer, you'd see a little more oil?
 (15) A That is correct, yes
 (16) Q Let me direct your attention to DX5719 Baker and ask you
 (17) about this First of all is it accurate that the first
 (18) commercial species to make its appearance in Prince William
 (19) Sound following the oil spill was Pacific herring?
 (20) A Yes that's true
 (21) Q Or at least of the species we're talking about here There
 (22) may have been - someone will tell me I missed a species
 (23) but -
 (24) A Right
 (25) Q Now, what does this chart tell us about the exposure of

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- (1) Pacific herring to dangerous petroleum chemicals following the
 (2) Exxon Valdez oil spill?
 (3) A Well we took water samples in the upper water column in
 (4) areas where we expected migrating herring to occur or to pass
 (5) As I indicated earlier we re not sure quite where the herring
 (6) are in the middle of winter but mostly they re west of Naked
 (7) Island and in Montague Pass but we sampled in those areas of
 (8) the red dots and what we found was the water quality
 throughout
 (9) this area was uniformly of a very high quality That means
 (10) very low concentrations of PAHs or PAHs well below the State
 (11) standard throughout the area So the water quality was good
 (12) where the herring might be moving to their spawn grounds
 (13) Q What do the little charts or boxes on the side tell us?
 (14) A Okay those are graphs I m sorry let met explain this
 (15) The top one there it says there were a hundred and ten
 samples
 (16) in this time period between April 1st and April 24th and we
 (17) picked that time interval because that s when the herring are
 (18) moving towards the areas where they spawn and in the map on
 (19) the - on the left there the black bands along the shore are
 (20) where the herring actually spawn and the little diamonds in
 (21) the graphs are individual water samples and the concentrations
 (22) of PAH in those water samples and for companson at the top
 (23) of each one we ve shown the State of Alaska standard of ten
 (24) parts per billion
 (25) So what these graphs show is water quality was of a very

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- (1) high quality throughout the area when the herring were moving
 (2) in to spawn
 (3) Q These black lines which at least from where I'm standing
 (4) don t look too sharp but these are the locations near the
 (5) shore where the herrings lay their eggs?
 (6) A Yes the herring lay their eggs right at the shore in the
 (7) subtidal and supratidal zone and those are the areas marked in
 (8) black where the herring actually spawned in 1989
 (9) Q Now do you know Dr Neff which if any of these areas
 (10) were areas where oil actually went ashore?
 (11) A Okay there are two areas where the herring spawn and the
 (12) oil coming ashore occurred together That s where there was
 an
 (13) overlap and these are - can I use this? Does this work or
 (14) no I guess not the overhead - anyway -
 (15) Q Would you prefer to have it up so you can do that?
 (16) A That s okay I can explain Maybe you can use a pointer
 (17) or I could use a pointer
 (18) Q Your permission Your Honor Real sense of power when
 (19) you re holding that thing
 (20) A The majority of herring spawning was up in the northeastern
 (21) Sound and the northern Sound in these areas which were well
 (22) outside the spill path However on the north shore of
 (23) Montague Island in a place called Rocky Bay some oil did
 come
 (24) ashore along the shore but the oil was very patchy and
 (25) generally considered light

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- (1) And then Naked Island is a very complicated island up here
 (2) lots of little bays and inlets perhaps some of you have been
 (3) there and some of these bays and inlets also received some oil
 (4) and also there was spawning in some of these bays Places like
 (5) Pass Harbor Outside Bay and Cabin Bay got both herring
 spawn
 (6) and some oil Again the oiling was generally light But
 (7) those are the two places where both oil and herring spawn
 (8) occurred together
 (9) Q And I note that in the graphs that we have on Exhibit
 (10) DX5719-Baker you have the VOAs and the PAHs listed
 separately
 (11) is that correct?
 (12) A That is correct.
 (13) Q And then you have the hatched area is the Alaska aromatic
 (14) limit?
 (15) A That s right.
 (16) Q And the Alaska aromatic limit takes the two in combination
 (17) is that correct?
 (18) A That s correct.
 (19) Q Have you looked at the question of whether if you combined
 (20) the VOA samples with the PAH samples you d get above the
 ten?
 (21) A Yes we did look at that That was a concern because what
 (22) scientists measure in the environment and what the State
 (23) standard says are somewhat different So we tried to make
 them
 (24) compatible and when we compared - when we took - we had
 data
 (25) we took very careful records so we knew that if we took a

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- (1) water sample for VOA and a water sample for Ph that we could
 (2) match them up later on as the same sample and when we did
 this
 (3) analysis in our computer we found that there was very little
 (4) overlap so that the total number of samples more than ten ppb
 (5) total PAH plus VOA was only a little - there were only a few
 (6) cases where the combination put it over that limit of ten parts
 (7) per billion So for the most part this is a good
 (8) representation of both VOAs and PAH We don t get more what
 (9) we call hits that is levels above ten if we combine the two
 (10) together
 (11) Q Measured by VOAs you had one sample where sometime
 (12) between April 1 and April 13 the VOAs in the water exceeded
 (13) the State limit is that correct?
 (14) A That s correct.
 (15) Q And that would have been one place? How long would that
 (16) situation continue in the normal course of -
 (17) A Well particularly for VOAs because as I indicated earlier
 (18) they don t want to stay in the water they evaporate quickly
 (19) it s likely that was a single event a small patch of water
 (20) that was there for a short period of time and we happened to be
 (21) there to sample it at that time It doesn t represent an
 (22) area wide trend
 (23) Most of the other values nearby were lower than that but
 (24) we've shown every single point for completeness and clarity
 (25) We haven t eliminated any points because they weren t the

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- (1) numbers we wanted So that would be a short lived event It
 (2) probably would have no effect on any herring that was passing
 (3) in through the area
 (4) Q Now these numbers these plots here both of the PAHs and
 (5) the VOAs as I understand your testimony if you had a factory
 (6) or a sawmill or a hotel and it was regularly day in and day
 (7) out producing that level of hydrocarbon in the water that
 (8) would be considered safe water under Alaska law?
 (9) A Under Alaska law that would be completely safe yes
 (10) Q Do you have an opinion, based on these data on the
 (11) question of whether herring migrating to spawn - migrating in
 (12) the Prince William Sound to spawn in 1989 April of 1989 were
 (13) at risk from the Exxon Valdez oil spill?
 (14) A Yes I do have an opinion
 (15) Q What is that opinion sir?
 (16) A My opinion based on all the scientific data is that the
 (17) herring the adult herring moving into the spawning areas were
 (18) not at risk from the hydrocarbons in the water column at that
 (19) time
 (20) MR LYNCH Your Honor I'll offer DX5719-Baker and
 (21) 1368 DX1368
 (22) (Exhibits DX5719-B and DX1368 offered)
 (23) MR O NEILL No objection on the condition that we
 (24) take a break now because it's 10 00
 (25) THE COURT Defendants Exhibit 5719-B - and 1368 is

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- (1) a defendants exhibit also isn't it?
 (2) MR LYNCH Yes Your Honor
 (3) THE COURT They're both admitted and we'll take our
 (4) break at this point We'll be in recess for 15 minutes
 (5) (Exhibits DX5719 B and DX1368 received)
 (6) (Jury out at 10 00 a m)
 (7) (Recess from 10 00 a m to 10 15 a m)
 (8) (Jury in at 10 15 a m)
 (9) THE COURT Mr Lynch you may continue
 (10) BY MR LYNCH
 (11) Q Dr Neff let me refer you to DX8895 What were you
 (12) studying that is illustrated by DX8895?
 (13) A As I indicated before the break the areas of herring
 (14) spawning are indicated by the black lines up here in the
 (15) northeast near Tatitlek Narrows and over Fairmont Bay and so
 (16) forth in the northern Sound as well as around Knight Island -
 (17) around Naked Island and on the north shore of Montague
 (18) Island
 (19) As part of our water quality program and as part of the program
 (20) performed by the National Oceanic and Atmospheric
 (21) Administration called NOAA water samples were taken and
 (22) various water quality measurements were made in herring
 (23) spawning areas that might have been affected by the oil spill
 (24) that is within the oil spill path particularly around Knight
 (25) Island - I mean around Naked Island and in Rocky Bay on the
 north shore of Montague Island where the pointer is right now

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- (1) Q Could you just touch the screen twice there
 (2) A Where here?
 (3) Q Just tap it twice
 (4) A Doesn't want to do anything Why isn't it doing anything?
 (5) Q Here we go that's what we want
 (6) Now these are the data as shown in the box to the right
 (7) are the water quality measurements that you made there?
 (8) A Yes they are and we've combined water quality
 (9) measurements that were taken by - during several Exxon
 (10) supported studies as well as studies performed by NOAA and
 so
 (11) the water samples include water collected in my studies and
 (12) offshore water quality and herring studies and so forth
 (13) performed for Exxon plus NOAA water quality studies
 (14) Next we used mussel studies Mussels are bivalve mollusks
 (15) that tend to bioaccumulate bacteria from the waters We can
 (16) back calculate the concentration of PAH in the water to which
 (17) the mussels were exposed These are mussels sitting on the
 (18) beach right next to where the herring are spawning so we
 (19) calculated what the mussels are exposed to the average
 (20) concentrations This is summarized in this graph The blue
 (21) stars are the mussel data and the red diamonds are the water
 (22) data and what we see here is that in early April and into May
 (23) period of spawning in 1989 the concentrations of PAH were
 very
 (24) good The water quality was excellent throughout this period
 (25) and after that period water quality got better and better but

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- (1) never did we find concentrations calculated either way that
 (2) exceeded the State of Alaska standards
 (3) Q Let's get a couple things clear here First of all there
 (4) was oil in the vicinity of some of these spawning sites
 (5) correct?
 (6) A Yes and in fact these data reflect that. You wouldn't
 (7) ordinarily get but around three or five parts per billion PAH
 (8) in the water if there was no oil around at all The background
 (9) concentrations are actually lower than that so the mussels as
 (10) well as the water quality data documented there was oil in the
 (11) general area at this time of spawning yes
 (12) Q That oil was on top to the extent it was still in the
 (13) water it was on top of the water?
 (14) A For the most part the oil was on the water surface and what
 (15) we're seeing here was actually in the water column and
 (16) available to critters living in the water column
 (17) Q In the nature of the rise and fall of the tides you're not
 (18) saying there were no herring ever exposed to oil in the areas
 (19) where the oil was present?
 (20) A No As I think I said earlier herring spawn both below
 (21) the low tide line and above the low tide line in what's called
 (22) the intertidal zone And if there's a lot of oil on the
 (23) substrate they like to spawn on kelp and seaweed and so
 (24) forth If that seaweed is oiled either before or after they
 (25) spawn and eggs come in contact with that oil they probably

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- (1) will suffer injury They may die
 (2) MR LYNCH Let me ask Rob to show us a videotape
 (3) which Mr Jamin has shown us once or twice You have the PX
 (4) number for that? This is PX247 A Alpha
 (5) (Videotape Played)
 (6) BY MR LYNCH
 (7) Q Now this is film or videotape that was taken at a time
 (8) when according to the witness who presented this videotape
 (9) the tide was in and as you can see that kelp is completely
 (10) submerged and the witness has testified that there s oil on
 (11) that kelp
 (12) If herring eggs were to be deposited on that kelp Dr
 (13) Neff in your opinion would those eggs have a chance of
 (14) producing successfully?
 (15) A Okay that s my first viewing of that thing and it looked
 (16) like the kelp which you called it was actually rockweed or
 (17) fucus which grows in the intertidal zone so I m quite sure
 (18) that that was intertidal area and of course, as you know the
 (19) tides come in and go out and there s a difference of about 12
 (20) feet between high tide and low tide So if you have a diver
 (21) swimming around just off the shore at high tide he s in an
 (22) area that s exposed to the air at low tide and I think what we
 (23) saw there is evidence that in fact that intertidal algae the
 (24) fucus was oiled by again oil coming in on the water surface
 (25) the tide goes out and the oil settles down on top of it.

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- (1) Now that actually did occur in many places throughout
 (2) Prince William Sound I don t know where those pictures were
 (3) taken but if a herring adult if the parents were so unwise as
 (4) to deposit their eggs on that stuff they probably - the eggs
 (5) probably would not survive
 (6) Q So the net effect is that where the substrate on which the
 (7) eggs came to be deposited did have oil on it and that oil was
 (8) under the water that would be harmful to the herring eggs
 (9) there s no argument about that is there?
 (10) A No there s no argument about that
 (11) Q That would reduce - all things being equal that would
 (12) reduce the reproduction of herring for that particular year is
 (13) that correct?
 (14) A That is correct
 (15) Q What would be the biological significance of that impact on
 (16) herring reproduction that is the kind of situation where oil
 (17) would get on the kelp itself?
 (18) A The biological significance of that is dependent completely
 (19) on how many miles of herring spawn were actually deposited
 (20) oiled fucus or oiled sea weeds and if that s a large part of
 (21) the total spawning then that could have a significant effect
 (22) at the population level What we re concerned about here I
 (23) don t want to be callous but herring deposits thousands of
 (24) eggs apiece and all that s needed during the life of that
 (25) herring is for two of those - and it does it several years in

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- (1) a row and all that s needed for that herring to maintain a
 (2) population is for two of those to survive to adult hood to
 (3) reproduce like their parents so there s a large natural
 (4) mortality So for it to have a significant impact on the adult
 (5) population you probably would have to have more than 50
 (6) percent of the herring affected in this way
 (7) Q And do the data that are available about where the oil was
 (8) and where the herring spawn occurred in 1989 give you any
 (9) indication about how significant the risk of herring eggs being
 (10) actually physically present in the oil was to the reproduction
 (11) of the herring population?
 (12) A Yes Of the total miles of herring spawn and often
 (13) fisheries biologists measure miles of shoreline where the
 (14) spawning occurs there were only two places where the oiling
 (15) maps show an overlap between the spawning miles and the
 (16) oiling
 (17) and those were as I ve already said were in Rocky Bay in the
 (18) north shore of Montague Island and in the bays on the
 (19) southern
 (20) and western shore of Naked Island that is Bass Harbor Cabin
 (21) Bay and Outside Bay In all of these areas the oiling was
 (22) generally very light and patchy and it s been estimated by
 (23) Exxon scientists and by the chief scientists of the trustees
 (24) that perhaps five to ten percent of the total miles of herring
 (25) spawned were in areas that actually were oiled in 1989
 (26) Now half of that in Prince William Sound the herring
 (27) spawn about half of the spawn is in the intertidal zone

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- (1) between the tides and half is below the tidal zone and the most
 (2) at risk are those in the intertidal zone So if you say five
 (3) to ten percent could have been in areas where there was
 (4) actually oil on the shore then half of that would be a
 (5) greatest risk in the intertidal zone that would reduce it down
 (6) to two to five percent of the total spawn probably did
 (7) experience direct contact with oil and probably suffered
 (8) significant effects from that
 (9) Q So based on the statistics that are available you would
 (10) think that where in the area of ten percent of the herring eggs
 (11) deposited that year might have been unable to reproduce
 (12) because
 (13) of the presence of oil?
 (14) A Yes that would be the upper limit estimate on my part
 (15) perhaps ten percent of the herring eggs did not survive or were
 (16) adversely affected by the oil
 (17) Q I d like to just spend a couple of minutes with you on the
 (18) blue stars which you told us were indications of tests done by
 (19) NOAA on mussels?
 (20) A That s right
 (21) Q The mussels were they taken out of a refrigerator or
 (22) something and placed there by NOAA or were these mussels
 (23) growing there naturally?
 (24) A These were mussels collected from the intertidal zone in
 (25) different areas where the herring were spawning and they were
 (26) used to indicate relative concentration of hydrocarbons in the

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- (1) area They were what I call Native mussels They lived there
 (2) before the spill they were living after the spill they were
 (3) collected from the shore in the time when herring were
 (4) spawning
 (5) Q And so you collect the mussels you cut them open and some
 (6) chemist figures out how many of these petroleum hydrocarbons
 (7) are in the flesh the body of the mussel?
 (8) A That is correct yes
 (9) Q And does the - I m pointing myself at the highest entry
 (10) for mussel Does that indicate that the measurement on that
 (11) particular mussel was less than five parts per billion or
 (12) active ingredient?
 (13) A No what that indicates is that if you calculate or
 (14) estimate the concentration of hydrocarbons or PAH in the water
 (15) column to which that mussel was exposed that number comes
 (16) out
 (17) to about five Now the mussel itself Hawaii actually has
 (18) higher concentrations of PAH and what that means is that the
 (19) mussels are able to accumulate the hydrocarbons from the
 (20) water
 (21) column That s why they re used They build up the
 (22) hydrocarbons in the tissue They filter very large volumes of
 (23) water
 (24) If you can imagine a little mussel on the shore filters
 (25) almost a gallon of water every hour and it does that to get
 (26) food And in the process if there s oil in the water and
 (27) solution or little particles of sediment with oil on it, it

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- (1) ingests those and these accumulate in its tissues
 (2) Now if the mussel then is taken to a clean area or the
 (3) oil goes away, he releases those hydrocarbons back to the
 (4) water So the level in the mussel tissues reflects what s in
 (5) the water that he s encountering, you might say that day or for
 (6) a few days just before we went out and cruelly wrenched them
 (7) from the shoreline and took them back to the laboratory and
 (8) analyzed them
 (9) Q Now the method this method of testing for hydrocarbons
 (10) is that a recognized scientific technique?
 (11) A Yes it is In fact NOAA the National Oceanic and
 (12) Atmospheric Administration had a country-wide program called
 (13) the National Status and Trends Program, Mussel Watch
 (14) Program
 (15) and they take mussels from shorelines throughout the country
 (16) to
 (17) evaluate the level or the status of pollution in urban areas
 (18) places like Seattle and Los Angeles and there are actually
 (19) several mussel watch stations in Prince William Sound that have
 (20) been sampled even before the oil spill
 (21) Q And what s the - what s the advantage of using mussels as
 (22) opposed to the method that is depicted by the little red
 (23) diamonds?
 (24) A Okay the two methods have their own advantages and
 (25) disadvantages The water sample is a discreet sample you can
 (26) compare it with a standard like the Alaska standard It s very
 (27) simple it s direct you know exactly what you ve got you know

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- (1) where you collected it what time
 (2) The mussel on the other hand does what we call
 (3) integrating exposure What it does is it s sampling the
 (4) environment all the time and for a period of time and the
 (5) level in its tissue reflects the average concentration for a
 (6) period of time maybe a week or a few days before you actually
 (7) went and collected it. So it - it evens out the ups and downs
 (8) but gives you an average concentration which is what you want
 (9) for a status study what s the average concentration of oil in
 (10) the water column Well the mussel will tell you that whereas
 (11) a single sample of water will tell you exactly what the
 (12) concentration is at one point at one time but won t give you
 (13) an average over a period of time unless you sample
 (14) everywhere
 (15) all the time every day So the mussel helps you get an
 (16) average concentration over time
 (17) Q So you take the actual concentration that you measure in
 (18) the mussel and then you do some kind of formula that tells you
 (19) what you think the concentration was in the water?
 (20) A Yes There have been several scientific studies and the
 (21) studies we used were done by EPA at their Narragansett lab in
 (22) Rhode Island There s a mathematical relationship between the
 (23) concentration in the water and the concentration in the mussel
 (24) tissues chemicals like PAHs
 (25) Q These figures have been - they re the result of doing that
 (26) calculation they re not the actual measure of the mussel s

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- (1) concentration?
 (2) A That is correct.
 (3) Q And did you draw any conclusions from the relationship
 (4) between the mussel plots and the direct measurement plots?
 (5) A Our objective in doing this was to determine if our water
 (6) samples reasonably reflected the overall trends in the
 (7) concentrations of PAH and other hydrocarbons in the water
 (8) We
 (9) recognize that this mussel extrapolation is only an
 (10) approximation but what the data shows is that there s
 (11) reasonably and very good agreement actually between the
 (12) water
 (13) data and the mussel data that gives us a very high degree of
 (14) confidence that taking the two together we have an accurate
 (15) representation of what herring eggs and larvae and so forth
 (16) were exposed to in that period of April when we took these
 (17) samples April and May
 (18) Q Dr Neff, I think many people would be concerned to learn
 (19) that the mussels are taking these even in minute quantities
 (20) are taking these chemicals in and they re building up in the
 (21) mussel s tissue Is that a danger?
 (22) A Well, if there was enough hydrocarbon in the water and the
 (23) mussels accumulated enough and mussels are very tolerant to
 (24) oil they can accumulate amazing amounts of PAHs But
 (25) basically, EPA has said if the concentration of the water is
 (26) below their criterion values then they account for - they
 (27) include consideration of bioaccumulation which we ve talked

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- (1) about So small levels of PAH in the mussel tissues are
 (2) commensurate That means they re not in disagreement with
 the
 (3) idea that there s an acceptable level of PAH in the
 (4) environment
 (5) So a certain level is acceptable and it would not pose a
 (6) harm to any animal that came along and chomped on that
 mussel
 (7) and ate him for dinner
 (8) Q Let me try to say that in simpler words The ten parts per
 (9) billion standard that Alaska sets recognizes that mussels and
 (10) other animals that live in the water will be accumulating these
 (11) chemicals and may actually get to a higher than ten level
 (12) themselves?
 (13) A Well yes in essence Alaska didn t consider
 (14) bioaccumulation but the Environmental Protection Agency in
 (15) developing their much less stringent criteria did consider
 (16) bioaccumulation so that is considered in the evaluation The
 (17) development of the criteria and levels in mussel tissues in
 (18) equilibrium with ten parts per billion would be acceptable
 (19) yes
 (20) Q What about fish do fish bioaccumulate the chemicals in the
 (21) water as they swim through?
 (22) A They do but to a much less extent because they have very
 (23) efficient enzyme systems for breaking down the chemicals and
 (24) excreting them rapidly so we wouldn t expect to see as high
 (25) concentration of PAH in the tissues of fish as we do in

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- (1) mussels They d be much lower if we could measure them at
 all
 (2) Q Now overall considering the measurements that are
 (3) represented here in DX8895 and the mussel measurements and
 your
 (4) general experience with the water quality sampling program
 that
 (5) you conducted what conclusion do you draw about the risk to
 (6) herring in the areas where herring spawn occurred in 1989?
 (7) A The risk to individual herring individuals particularly
 (8) the eggs and larvae obviously there was some danger that
 (9) individual animals died as a result of the oil spill The
 (10) population level I think that smaller risk to individuals is
 (11) not translated to the population level In other words the
 (12) risk to the population of herring in Prince William Sound was
 (13) not significant after the oil spill
 (14) MR LYNCH Your Honor I ll offer 8895
 (15) (Exhibit 8895 offered)
 (16) MR O NEILL No objection
 (17) THE COURT Defendants Exhibit 8895 is admitted
 (18) (Exhibit 8895 received)
 (19) BY MR LYNCH
 (20) Q Let me show you Exhibit 8888 Dr Neff and could you just
 (21) very briefly tell us what if anything this adds to the
 (22) discussion we ve just had about water quality levels in the
 (23) vicinity of Naked Island?
 (24) A Okay this is an extent of the same graph we just saw The
 (25) whole bunch of stars and diamonds on the left hand side

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- (1) under - over 1989 those are the data I just showed you But
 (2) we went back and NOAA went back in 1990 and again in 1991
 and
 (3) sampled the same location or some of the same locations
 because
 (4) of concern of long term effects on herring populations
 (5) What we see here is that after 1989 the concentrations of
 (6) hydrocarbons in the water where the herring were spawning
 went
 (7) way down There were a few slightly elevated levels I
 (8) believe those were McPherson Passage on Naked Island And
 by
 (9) 1991 basically all the numbers were down on the baseline
 (10) there That means we had trouble even detecting any
 (11) hydrocarbons at all or it was near or detection limits just
 (12) above it well under a part per billion So basically the
 (13) water quality was pretty good in 1989 it got better in 1990
 (14) and was basically pristine by 1991
 (15) MR LYNCH I ll over 8888 DX8888 Your Honor
 (16) (Exhibit 8888 offered)
 (17) MR O NEILL I have no objection
 (18) THE COURT Defendants Exhibit 8888 is admitted
 (19) (Exhibit 8888 received)
 (20) BY MR LYNCH
 (21) Q I d like to turn now Dr Neff to the question of - I m
 (22) sorry I don t want - I don t want to turn to the question
 (23) Let me show you DX5708 Alpha and this refers to a
 (24) different kind of testing that you also did about the safety or
 (25) the risk that chemicals in the water presented in 1989?

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- (1) A Yes we were concerned that just doing chemical - I m a
 (2) biologist and so I know a lot of chemistry I ve done chemistry
 (3) most of my professional life but I m a biologist and I want to
 (4) know are the animals going to be affected by this stuff
 (5) irrespective of the chemistry
 (6) And so in addition to our water samples that we analyzed
 (7) for petroleum hydrocarbons for PAH and VOAs we also took
 water
 (8) samples during our early uses early field surveys in 1989 in
 (9) the period - in this case a few studies in June or July off
 (10) heavily oiled beaches and we subjected them to what are
 called
 (11) laboratory toxicity tests or bioassays to determine if the
 (12) water in Prince William Sound was toxic to marine animals
 (13) And we did several standard EPA toxicity tests with very
 (14) sensitive species and one of this shows early life stages of
 (15) sheepshead minnow little minnow that swims around near the
 (16) shore there was no effect of the water from Prince William
 (17) Sound on these animals and these were acute toxicity - well
 (18) they re actually run for seven days but they re a toxicity
 (19) test we measured survival and this says survival of all the
 (20) individuals was no different between those exposed to Prince
 (21) William Sound water and those exposed to clean water from
 (22) another location that had never been subjected to an oil spill
 (23) Q So basically what you found was that from the point of
 (24) view of the fish the water that had oil on the top and the
 (25) water that had never seen oil on the top the fish seemed to

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- (1) survive about the same?
 (2) A That s right There was no difference
 (3) Q And this little I beam on the top of each of these bars
 (4) what does that refer to?
 (5) A That s a statistical parameter called 95 percent confidence
 (6) interval said if you repeated that test a hundred times you d
 (7) get - your results would fall between those two bars in the H
 (8) every time or 95 percent of the time almost every time
 (9) MR LYNCH Your Honor I ll offer 5708 Alpha
 (10) DX5708 Alpha
 (11) (Exhibit 5708 A offered)
 (12) MR O NEILL No objection
 (13) THE COURT Defendants Exhibit 5708 A is admitted
 (14) (Exhibit 5708 A received)
 (15) MR LYNCH And DX5715 is a similar method of testing
 (16) using - presented on a similar chart as to sheepshead minnows
 (17) in April of 1989 DX5714 is a similar chart about a test of
 (18) algal cell density in April of 1989 And DX5717-Alpha is a
 (19) similar test on mysid shrimp for the period April 3 to April
 (20) 14 1989
 (21) In the interest of time Your Honor I ll offer those
 (22) without going through each of them individually, but I will ask
 (23) Doctor -
 (24) (Exhibits DX5715 DX5714 and DX5717 A offered)
 (25) MR O NEILL No objection

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- (1) THE COURT The last one was 57 -
 (2) MR LYNCH 17 Alpha
 (3) THE COURT There being no objection they are
 (4) admitted
 (5) (Exhibits DX5715 DX5714 and DX5717 A received)
 (6) BY MR LYNCH
 (7) Q And you heard me describe those exhibits Dr Neff Is it
 (8) correct that those charts are to be interpreted substantially
 (9) the same way?
 (10) A That is true yes
 (11) Q And the other substances are besides sheepshead shrimp
 (12) over mysid shrimp?
 (13) A They re considered by EPA to be the most sensitive animals
 (14) to marine pollution so they ve been recommended to be used
 (15) in
 (16) these tests throughout the country Mysid shrimp are similar
 (17) to the small shrimp like creatures that herring feed on and
 (18) juvenile salmon feed on in Prince William Sound
 (19) Q When you say small shrimp how small is small? Are we
 (20) talking about a shrimp I could have in salad?
 (21) A No a shrimp more like a quarter of an inch long, little
 (22) guys The herring and salmon love them in large quantities
 (23) Q And the other one was algal -
 (24) A These are algae these are the single-celled microscopic
 (25) plants that live in the upper ocean and provide the basis for
 the food chain in Prince William Sound and elsewhere They re

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- (1) called phytoplankton and we did studies with phytoplankton to
 (2) determine the effects of three different types of organisms
 (3) plants little shrimp like creatures and little fish
 (4) Q And mysid shrimp and algae taken together does that give
 (5) you an indication of how phytoplankton and zooplankton would
 (6) fare?
 (7) A That would be an indication how phytoplankton and
 (8) zooplankton would fare under an oil slick yes
 (9) Q Let me refer you to DX5723 Alpha Would you tell us what
 (10) that chart reflects Dr Neff?
 (11) A Okay there are several salmon hatcheries in Prince William
 (12) Sound This shows some data for three pink salmon hatcheries
 (13) that were outside the spill path Again one of the major
 (14) concerns as I indicated earlier were the commercial fisheries
 (15) and so a lot of our water sampling was around hatcheries in the
 (16) Sound These are hatcheries as I said outside the spill path
 (17) area We wouldnt have expected high concentrations of
 (18) hydrocarbons in the water column and in fact that s what we
 (19) see The water - the water quality around these hatcheries is
 (20) excellent It was perfect for support of juvenile salmon being
 (21) released from the hatcheries in the time frame of this
 (22) picture
 (23) MR LYNCH Offer DX5723 Alpha Your Honor
 (24) (Exhibit DX5723 A offered)
 (25) MR O NEILL No objection

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- (1) THE COURT That exhibit is admitted
 (2) (Exhibit DX5723 A received)
 (3) BY MR LYNCH
 (4) Q Let me ask you to look at Exhibit DX5722 Baker This is a
 (5) similar chart. Could you explain that chart Dr Neff?
 (6) A Yes there was one hatchery in Prince William Sound was in
 (7) the spill path that s the A F Koernig hatchery down on Evans
 (8) Island in Sawmill Bay That hatchery has been there for quite
 (9) a while and it was right there the spill and they put booms
 (10) around the entrance of Sawmill Bay so no oil got into the bay
 (11) itself, but there still was concern when they released the
 (12) salmon fry which they did I believe in late April and early
 (13) May that they could be affected by the oil spill So we did a
 (14) lot of sampling around Sawmill Bay and around where the fish
 (15) might go
 (16) And again we found uniformly very high water quality very
 (17) low concentrations of PAH and VOAs Again the water quality
 (18) there was very good very suitable for propagation of salmon
 (19) fry
 (20) Q At the time salmon fry was released by all four hatcheries
 (21) your finding was below the surface of the water the water was
 (22) not affected by petroleum chemicals at a level that would be
 (23) harmful to the young pink salmon?
 (24) A That is correct
 (25) Q Let me show you DX5720 Alpha

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- (1) THE COURT Are you going to admit 5722?
 (2) MR LYNCH Yes Your Honor
 (3) (Exhibit DX5722 B offered)
 (4) MR O NEILL No objection
 (5) THE COURT Is there objection?
 (6) MR O NEILL No objection Judge
 (7) THE COURT Defendants Exhibit 5722 B is admitted
 (8) (Exhibit DX5722 B received)
 (9) BY MR LYNCH
 (10) Q Could you tell us what is summarized by Exhibit
 (11) 5720 Alpha?
 (12) A Okay Salmon after they come out of the hatcheries or
 (13) after they come out of the wild run salmon as they re called
 (14) after they come out of the streams where they've overwintered
 (15) congregate in coastal waters throughout Prince William Sound
 (16) and feed and grow for a period of time before they move out to
 (17) sea to spend a year in the ocean before coming back The
 (18) adults come back starting in late July and early August into
 (19) September to come back to the streams where they grew up
 and
 (20) of course back to the hatcheries where they re caught and sold
 (21) or used to get new fry next year
 (22) And so we sampled throughout the areas where the salmon
 (23) might congregate might migrate during the fry stage the early
 (24) life stages when they re growing after coming out of the
 (25) streams and then during the fall late summer and fall when

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- (1) they come back as adults And this summarizes a very large
 (2) amount of data about the water quality in areas of Prince
 (3) William Sound where herring (sic) might occur at different
 (4) times of year
 (5) Q Herring?
 (6) A I m sorry salmon I know the difference it just - and
 (7) we - there s a bar a bar on the top there showing the time of
 (8) the hatchery releases which was as I say, late April and
 (9) into - well into May and again a very large number of water
 (10) samples included here from both Exxon and NOAA data and
 what
 (11) we see is that most nearly always the water quality was
 (12) excellent There are a few exceptions and those are in July
 (13) you see a vertical series of triangles not a triangle -
 (14) Q Diamonds?
 (15) A Diamonds yeah I ll get it right Both in the VOAs and
 (16) the PAHs what was happening there that was Northwest Bay in
 (17) the north shore of Eleanor Island That was a heavily oiled
 (18) bay NOAA agrees Exxon agrees that that was very heavily
 (19) oiled During the time we were taking the samples they were
 (20) cleaning up most of the eastern shore of Northwest Bay There
 (21) was a major cleanup effort going on and what is reflected here
 (22) the affect of that cleanup effort on water quality We had a
 (23) few samples that had more than ten part per billion Alaska
 (24) standard This was a short period of time When we went back
 (25) just a little while later the water quality had returned to

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- (1) normal level
 (2) There s another couple of values in July of elevated levels
 (3) and again that was monitoring what Exxon did around
 shoreline
 (4) cleanup sites I believe this was on the north shore of
 (5) Elrington Island down in the southern part of the Sound What
 (6) Exxon was concerned about that in beach cleaning where they
 (7) went in with high pressure hoses on the beach and tried to wash
 (8) the oil off the shore into the intertidal - into the subtidal
 (9) water and then collect it with skimmers that some of the oil
 (10) might escape under the booms There were two layers of
 booms
 (11) put out to protect from any oil escaping but we monitored both
 (12) inside the booms outside the booms both before during and
 (13) after this cleanup effort and those higher values were taken
 (14) during the cleanup effort at one location in Elrington Island
 (15) and reflect that in some cases a few cases - most cases none
 (16) of the water quality went below the Alaska standard but in a
 (17) few cases, we did exceed the limit for a short period of time
 (18) We went back the next day to the same place and the water
 (19) quality was fine So what we see here is with the exception
 (20) of in the immediate vicinity of cleanup efforts the water
 (21) quality throughout Prince William Sound was excellent for
 (22) salmon throughout the summer of 1989
 (23) Q Now let s just again be clear Do these data indicate to
 (24) you that there was never a time when pink salmon in Prince
 (25) William Sound might have been exposed to levels of petroleum

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- (1) chemicals that could be dangerous to them?
 (2) A What the data show is that there are a few very short
 (3) instances when water quality was less than we would hope or
 the
 (4) State would mandate But as far as the water quality or water
 (5) column exposure is concerned water quality was uniformly
 (6) excellent for salmon throughout the year However there is
 (7) one period when salmon might be exposed to oil that s not
 (8) considered here and that is when the young fry, called
 (9) alevins they've just hatched from the egg but they re still in
 (10) the gravel might be exposed to the oil in the gravels of their
 (11) streams where they were deposited This might have occurred
 in
 (12) the period from March - well after the spill when it came
 (13) ashore
 (14) In Knight Island it was late March to early April and May
 (15) before they emerged from the gravels and there is some
 (16) indication that some herring (sic) alevins were exposed to oily
 (17) gravel in that time period in 1989
 (18) Q Let me see if I understand that You didn t sample you
 (19) didn t have a way to sample the purity of the water where oil
 (20) had actually become commingled with the gravel is that what
 (21) you re saying?
 (22) A That wasn t part of my program I believe other
 (23) investigators might have studied that
 (24) Q It s possible in those areas if there were eggs deposited
 (25) there or small fish there that pink salmon were - some pink

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(1) salmon were exposed to a dangerous level of petroleum hydrocarbons?
 (2) hydrocarbons?
 (3) A Yes that's quite possible that occurred
 (4) Q Do you have any way to estimate the size of that exposure in terms of the population of pink salmon that return to Prince William Sound annually?
 (5) William Sound annually?
 (6) A Well we know that well over a billion salmon fry emerge from Prince William Sound every year That's a tremendous number Most of those salmon come from the hatcheries that I just talked about Well over 700 million salmon in 1989 And so most of the salmon avoided the spill at that time in their life cycle They were in the hatcheries The hatcheries did not release the salmon until they were sure or reasonably confident enough of the oil had gone away so that the salmon weren't endangered So that leaves us the wild run salmon These are the salmon that go up in the natural streams along Knight Island, Montague Island and so forth and I've heard various estimates of the number of salmon streams in Prince William Sound that were actually oiled because many of the salmon streams weren't oiled If you have enough fresh water flow in the stream the oil won't come in it can't go upstream It can only come in if it settles there at low tide and the flow is not too high and I've heard an estimate of 25 percent of the wild salmon streams might have gotten some oil so that would be the upper bound limit 25 of less than 50

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(1) percent of the total salmon so it's a very small fraction I guess it would come down to maybe five or ten percent of the salmon fry might have been exposed as alevins
 (2) guess it would come down to maybe five or ten percent of the salmon fry might have been exposed as alevins
 (3) salmon fry might have been exposed as alevins
 (4) MR LYNCH Your Honor I offer DX5720 Alpha
 (5) (Exhibit 5720-A offered)
 (6) MR O NEILL. No objection
 (7) THE COURT That exhibit is admitted
 (8) (Exhibit 5720 A received)
 (9) BY MR LYNCH
 (10) Q The last exhibit I have today, everyone will be delighted to hear is DX8886 Is this just a summary of your overall Prince William Sound water quality sampling program?
 (11) to hear is DX8886 Is this just a summary of your overall Prince William Sound water quality sampling program?
 (12) Prince William Sound water quality sampling program?
 (13) A Yes it is
 (14) Q Over the two and a half years?
 (15) A That's correct
 (16) Q And this exhibit relates only to the PAHs or the poly aromatic hydrocarbons?
 (17) aromatic hydrocarbons?
 (18) A That is correct yeah
 (19) Q And not the VOAs?
 (20) A That's correct
 (21) Q You would expect as I gather the VOAs to have evaporated fairly early in the process?
 (22) fairly early in the process?
 (23) A Yes Our studies generally show that we saw VOAs in the water column only in the first few - month or so after the spill and by summer they had virtually gone except for a few

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(1) isolated instances
 (2) Q So that's the reason for the difference between 1500 and 67 and the 2400 samples that were on the earlier chart?
 (3) and the 2400 samples that were on the earlier chart?
 (4) A Yes the others were VOA samples
 (5) Q You also did water quality sampling outside of Prince William Sound?
 (6) William Sound?
 (7) A Yes there was a fairly extensive program in the Gulf of Alaska entrance to Cook Inlet around in the Shelikof Straits and so forth
 (8) Alaska entrance to Cook Inlet around in the Shelikof Straits and so forth
 (9) and so forth
 (10) MR LYNCH I offer DX8886 Your Honor
 (11) (Exhibit DX8886 offered)
 (12) MR O NEILL. No objection
 (13) THE COURT That exhibit is admitted
 (14) (Exhibit DX8886 received)
 (15) BY MR LYNCH
 (16) Q Dr Neff, looking at the totality of the water quality sampling and testing that you conducted beginning on March 29 1989 and continuing to 1991 do you have an opinion as to whether oil from the Exxon Valdez oil spill could have had a population level impact on the herring population in Prince William Sound?
 (17) William Sound?
 (18) 1989 and continuing to 1991 do you have an opinion as to whether oil from the Exxon Valdez oil spill could have had a population level impact on the herring population in Prince William Sound?
 (19) whether oil from the Exxon Valdez oil spill could have had a population level impact on the herring population in Prince William Sound?
 (20) population level impact on the herring population in Prince William Sound?
 (21) William Sound?
 (22) A Yes I have an opinion
 (23) Q What is that opinion sir?
 (24) A The opinion is that none of my data would indicate that there was any population level impact on herring in Prince

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(1) William Sound
 (2) Q And by population level we mean an impact that would cause the fish not to return in numbers equivalent to the population that existed there at that time?
 (3) the fish not to return in numbers equivalent to the population that existed there at that time?
 (4) that existed there at that time?
 (5) A That's right an impact on the commercial fishery the total population that's exploited
 (6) total population that's exploited
 (7) Q Do you have an opinion on the same terms about whether or not the oil from the Exxon Valdez oil spill had a population level impact on pink salmon in Prince William Sound?
 (8) not the oil from the Exxon Valdez oil spill had a population level impact on pink salmon in Prince William Sound?
 (9) level impact on pink salmon in Prince William Sound?
 (10) A Yes I do
 (11) Q And what is that opinion?
 (12) A My opinion is that my data and that of NOAA and so forth that I've used here is consistent with the conclusion that the pink salmon population in Prince William Sound was not adversely affected by the Exxon Valdez oil spill
 (13) that I've used here is consistent with the conclusion that the pink salmon population in Prince William Sound was not adversely affected by the Exxon Valdez oil spill
 (14) pink salmon population in Prince William Sound was not adversely affected by the Exxon Valdez oil spill
 (15) adversely affected by the Exxon Valdez oil spill
 (16) Q Now, have you considered in addition to your own testing activity and in addition to your own direct experience have you considered the literature of other scientists around the world who've been involved in oil spill situations and their relationship to fisheries?
 (17) activity and in addition to your own direct experience have you considered the literature of other scientists around the world who've been involved in oil spill situations and their relationship to fisheries?
 (18) you considered the literature of other scientists around the world who've been involved in oil spill situations and their relationship to fisheries?
 (19) world who've been involved in oil spill situations and their relationship to fisheries?
 (20) relationship to fisheries?
 (21) A Yes, I have I've examined published literature and much of the unpublished literature about oil spills in the past all the major oil spills that have occurred in the last 20 or 30 years, and based on that, yes I've tried to relate that to what we've been seeing with the Exxon Valdez oil spill

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- (1) Q And if you look in terms of what has been disclosed in the
 (2) literature are you aware of any instance disclosed in the
 (3) professional or scientific literature that would indicate a
 (4) population level impact to a commercial fishery from an oil
 (5) spill like the Exxon Valdez?
 (6) A There have been no reports of significant population level
 (7) impact to any commercial fishery after an oil spill even much
 (8) larger oil spills than the Exxon Valdez
 (9) Q Now it's been suggested by witnesses who've testified in
 (10) this case that the effect of the oil spill was to cause some
 (11) problems to - some seeds of problems to be planted in 1989
 (12) which only came to bloom in 1993 or 1994 that the problems
 (13) from the oil spill showed up one or two harvest years later or
 (14) three harvest years later
 (15) Based on your experience as a marine biologist do you know
 (16) of any mechanism that would explain the population level
 impact
 (17) to a commercial fishery from oil that did not show up until two
 (18) or three years after the exposure to oil?
 (19) A I know of no mechanism biological mechanism by which that
 (20) could occur no
 (21) Q Now in the Amoco Cadiz situation you yourself
 (22) discovered an impact on a fishery did you not sir?
 (23) A Yes we did
 (24) Q That was the plaice spelled some other way?
 (25) A That's correct uh huh

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- (1) Q And what over time what was the nature of that impact,
 (2) did it get worse or better or -
 (3) A Well these plaice as I said they're bottom living fish
 (4) they feed on animals on the bottom The benthic infauna we
 (5) talked about earlier they were in very heavily oiled
 (6) estuaries the oysters in those estuaries had much higher
 (7) concentration of PAH than any of the mussels we examined in
 (8) Exxon and NOAA and it was a heavy impact and these plaice
 had
 (9) a variety of clinical manifestations of harm various lesions
 (10) in the liver and so forth and the digestive tract condition
 (11) called fin necrosis which is you know the fins waste away
 (12) and so forth And there was a moderate instance of that
 (13) shortly after the spill and various other conditions continued
 (14) for a period of time
 (15) We examined the plaice for 27 months after the spill,
 (16) little over two years and most of those conditions improved
 (17) during that time Now there were some that were still
 (18) existent after that Other investigators French investigators
 (19) have followed that longer and shown that the plaice population
 (20) has completely recovered within about three years after the
 (21) spill
 (22) Q Now in that case was there any symptom that you observed
 (23) that just sprang up for the first time one or two years after
 (24) the - or in your case 27 months after the exposure to oil?
 (25) A No there was not

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- (1) Q So the symptoms that you saw you saw immediately after
 the
 (2) oil?
 (3) A That's consistent with what we saw and what everyone else
 (4) has seen in other spill areas
 (5) Q Have you looked into the fisheries experience in connection
 (6) with the Santa Barbara channel blowout in 1969?
 (7) A Yeah that was a fairly famous oil spill the first one I
 (8) think to galvanize the U S public awareness of oil spills and
 (9) that was a long term spill that lasted actually three months
 (10) more than three million gallons were released into the Santa
 (11) Barbara channel from a blowout and that's a major fishery
 (12) area and two of the commercial species there the sardine and
 (13) the anchovy are very similar to herring in some ways They
 (14) feed in the upper water column on small organisms and there
 (15) was a lot of concern about the anchovy and sardine fishery
 (16) there
 (17) And fisheries biologists from the Southeast Fisheries
 (18) Center studied it very extensively and they documented they
 (19) had lots - unlike Prince William Sound they had lots of data
 (20) from before the spill and lots of data during and after the
 (21) spill and were able to show that there was no effect on the
 (22) sardine or anchovy fishery
 (23) There was also a mackerel fishery there that was very
 (24) important and in fact there was one report that the fishermen
 (25) of course were concerned about oiling their nets with the

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- (1) floating oil that was all around Santa Barbara channel but
 (2) they found in overflight with the spotter planes that they
 (3) could see the anchovies under the oil slicks so they would
 (4) watch the anchovies until they came out from the oil slick and
 (5) send the fishermen out to catch the anchovies clean and
 (6) acceptable for harvest and so forth And basically no
 (7) significant impacts on any of those fisheries other than a
 (8) temporary decrease in fishing because of the oil on the water
 (9) surface
 (10) Q Now I want to go back to those I beams that you had on one
 (11) of your charts the 95 percent confidence level that you talked
 (12) about and there's been some discussion in this case about
 what
 (13) scientists consider to be efficient basis to form a conclusion
 (14) or give an opinion
 (15) The jury in this case has been advised that they are to
 (16) decide on a more probable than not standard 50 percent or 51
 (17) percent Now trying to apply that standard and using your
 (18) expertise in marine biology for the benefit of the jury if you
 (19) were being asked whether it's more probable than not 51
 (20) percent just even the chances that the problems that have
 (21) shown up in 1993 and 1994 in Prince William Sound resulted
 from
 (22) the 1989 Exxon Valdez oil spill what in your opinion is the
 (23) likelihood? Is it a 50 percent likelihood that the oil spill
 (24) contributed to these problems?
 (25) A I think it's an extremely low - I would place it down one

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- (1) percent or less the problems we're seeing now with fisheries
 (2) in Prince William were in any way directly related to the oil
 (3) spill of 1989
 (4) Q So if you - if you use your scientific information about
 (5) the way fish live and the way petroleum interacts with fish and
 (6) you try to use the court standard instead of the scientific
 (7) standards you would not reach the 50 percent level?
 (8) A Never no I would not.
 (9) MR LYNCH Thank you very much Doctor
 (10) THE COURT You may cross-examine
 (11) CROSS EXAMINATION OF DR JAMES NEFF
 (12) BY MR O NEILL
 (13) Q Doctor I first want to explore with you briefly the number
 (14) of subjects that you came here to testify about today as an
 (15) expert. And you've testified about pink salmon is that a
 (16) correct statement?
 (17) A That's correct.
 (18) Q You've testified about herring that's a correct statement?
 (19) A That's correct.
 (20) Q And you've testified about fisheries that's a correct
 (21) statement?
 (22) A Yes to a limited extent.
 (23) Q And you've testified about commercial fisheries in France
 (24) that's a correct statement?
 (25) A That's correct.

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- (1) Q And you testified about commercial fisheries in Prince
 (2) William Sound that's a correct statement, isn't it?
 (3) A That's correct.
 (4) Q And you testified about the history of oil spills in the
 (5) modern world that's a correct statement, isn't it?
 (6) A That is correct.
 (7) Q And you've testified about how oil flows and in what
 (8) direction it flows that's a correct statement, isn't it?
 (9) A That is correct
 (10) Q And you've testified about chemistry and different chemical
 (11) analyses that's a correct statement isn't it?
 (12) A That's correct.
 (13) Q You've testified about a lot of different things haven't
 (14) you?
 (15) A Certainly have
 (16) Q Now, you began your testimony talking about the Amoco
 (17) Cadiz
 (18) spill and the Amoco Cadiz spill while it may have spilled
 (19) more oil impacted a heck of a lot less shoreline than the
 (20) Exxon Valdez spill did didn't it, only 375 kilometers?
 (21) A That is correct, but the impact was much greater on that
 (22) shoreline
 (23) Q And the number of miles of shoreline that were affected by
 (24) the Prince William Sound spill far exceeded that than the Amoco
 (25) Cadiz spill didn't it?
 (26) A The miles of shoreline that were affected to some extent,

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- (1) yes exceeded that.
 (2) Q Now you testified here about the major economic value of a
 (3) fishery being its - an area like Prince William Sound a
 (4) fishery being its commercial fishery and you said there's
 (5) never been a report of a major loss Those were your words
 (6) Do you recall that?
 (7) A Okay
 (8) Q Now to him over there who's a commercial fisherman if he
 (9) doesn't fish for a season that's a major loss isn't it?
 (10) A It could be yes to him
 (11) Q And there were an awful lot of fishermen you're aware that
 (12) there were thousands and thousands and thousands of
 (13) fishermen
 (14) 3500 3300 permit holders and almost 10 000 fishermen that
 (15) didn't fish in 1989 as a result of the Exxon Valdez spill
 (16) you're aware of that?
 (17) A I don't know the number
 (18) Q A lot?
 (19) A I'll take your word for it
 (20) Q So at least with regard to the fish that they didn't catch
 (21) in 1989 you sitting here as an expert on fishery harvests and
 (22) oil spills would admit that to those fishermen that was a
 (23) major loss?
 (24) A That is correct.
 (25) Q And would you also agree that to a Native whose dining room
 (26) table is the intertidal zone if he can't collect from that

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- (1) intertidal zone as a result of an oil spill that's a major
 (2) loss?
 (3) A That's correct.
 (4) Q And with regard to both of those people the fishermen and
 (5) the Native the oil spill in many respects was a tragedy would
 (6) you agree with that?
 (7) A Yes, I do agree
 (8) Q Just so we're clear Now let's move on to science Would
 (9) you agree with the proposition that in looking at pink returns
 (10) and herring returns in Prince William Sound in 1993 and 1994
 (11) we have a serious problem?
 (12) A My understanding is that both returns are way down from
 (13) previous historical returns
 (14) Q In 1993 and 1994, if you look at herring and salmon returns
 (15) and you look at the condition of the herring, one might draw
 (16) the conclusion that Prince William Sound is sick, would you
 (17) agree with that statement?
 (18) A Not necessarily, no
 (19) Q Now, we were looking at - when you talk about these PAH
 (20) levels that's the poisonous carcinogenic part of oil It's the
 (21) part of the oil that is most dangerous to living things?
 (22) A Okay the PAHs in petroleum very few are carcinogenic
 (23) There are a few high molecular weight ones not in the water
 (24) column
 (25) Q They're not?

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- (1) A Very trace levels much much better than what we re
 (2) talking about here
 (3) Q Now I want to go back if we could let s start at the
 (4) beginning of your employment with Exxon And you worked for
 (5) Battelle Laboratories?
 (6) A That is correct yes
 (7) Q While Battelle is set up as you stated a nonprofit
 (8) operation it s a company and it goes to people like Exxon and
 (9) does work for Exxon and it gets paid?
 (10) A That is correct
 (11) Q And you get paid when Battelle gets paid?
 (12) A I receive a salary from Battelle yes
 (13) Q So Battelle isn t like the trustees or the National
 (14) Institute of Health or the National Institute of Sciences It
 (15) is a private corporation that does research for pay?
 (16) A It s not a corporation It s a not for profit research
 (17) organization
 (18) Q It s a not for profit research corporation, it s a not for
 (19) profit corporation?
 (20) A I don t know the legal terms I m sorry
 (21) Q Let s stick with where we re going and Al Maki from Exxon
 (22) Corporation hired you to come and work for Exxon in 1989?
 (23) A That is correct
 (24) Q And John Prince (ph) was an engineer at Exxon who was in
 (25) charge overall of the Exxon science program?

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- (1) Q So Pentec was looking at the impacts of the oil on the
 (2) shoreline and the cleanup on the shoreline?
 (3) A That s correct yes
 (4) Q And John Houghton and Dennis Lees work for Pentec isn t
 (5) that right?
 (6) A That is correct
 (7) Q And Houghton - and you know Mr Lees don t you?
 (8) A I know both gentlemen yes
 (9) Q They re both scientists aren t they?
 (10) A Yes I believe so
 (11) Q And Houghton and Lees and Pentec at some time or another
 (12) ended up having a disagreement with Exxon isn t that right?
 (13) A That appears to have been the case yes
 (14) Q And indeed Mr Houghton and Mr Lees were of the opinion
 (15) that the shoreline cleanup was damaging the ecology or further
 (16) damaging the ecology of areas where the cleanup was taking
 (17) place and they were vocal about that isn t that right?
 (18) A That is correct.
 (19) Q And Pentec and Houghton and Lees were fired by Exxon
 (20) weren t they?
 (21) A They were fired
 (22) Q And they were fired for speaking the truth weren t they?
 (23) A I have no idea why they were fired That is not within my
 (24) realm of knowledge
 (25) Q Now I want to go to your specific studies and I want to

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- (1) A In the summer about August I think he came on board yes
 (2) Q And that same Mr Prince at some point in time indicated to
 (3) you that lawyers would be reviewing your scientific work?
 (4) A That subject came up in the fall of 1989 yes
 (5) Q And you did over the course of the years while doing your
 (6) scientific work meet with Exxon lawyers both in house and the
 (7) law firms?
 (8) A Mostly after 1989
 (9) Q And you were advised to be cautious about your note taking
 (10) weren t you?
 (11) A Yes
 (12) Q And the reason that you were advised - normally you take
 (13) good solid detailed notes but the reason you were advised to
 (14) be cautious about your note taking was because any written
 (15) document could be discovered in the litigation and we d have to
 (16) talk about it here?
 (17) A That was one of the reasons given yes
 (18) Q Now I want to talk for a minute about Pentec You were
 (19) involved in the initial phases of developing Exxon s science
 (20) program?
 (21) A That s correct
 (22) Q And there was some work done in your area by Pentec even
 (23) before you got around to it isn t that right?
 (24) A Pentec was involved in some work on the shoreline yes not
 (25) the water quality

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- (1) recognize a problem and that is - and it s a problem not with
 (2) the studies it s a problem that is inherent in oil And that
 (3) is if the sooner we can sample thoroughly after the spill the
 (4) better we can measure whatever shock to the system the spill
 (5) had because you get - you do get evaporation and you want a
 (6) complete data set.
 (7) So if we measure in April or May or June and the spill
 (8) happens on Good Friday in March we have a problem in
 (9) measuring
 (10) the shock if we re going to measure the chemicals because the
 (11) shock s already taken place, does that make sense?
 (12) A Not completely
 (13) Q Makes no sense?
 (14) A It makes some sense
 (15) Q Okay And another problem that is inherent in going out
 (16) and - how big is Prince William Sound? It s just huge isn t
 (17) it?
 (18) A Huge several thousand square miles
 (19) Q And as good as we are at picking where we re going to
 (20) measure a problem with the water sampling program is we
 (21) could
 (22) be sampling in the wrong places?
 (23) A We can t sample everywhere that s true
 (24) Q I mean I m not criticizing your study I m just saying -
 (25) A That s correct
 (26) Q It s in the beast And you would admit - and we don t
 (27) have to get into how likely it is that there may be many areas

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- (1) in which the PAH levels were higher than those you in fact
 (2) measured You did your best but that s a possibility isn t
 (3) it?
 (4) A We sampled a large number of locations that I think we have
 (5) a reasonably good confidence that we covered the waterfront,
 as
 (6) they say There probably were not large numbers of the areas
 (7) of the Sound that had higher concentrations but there could be
 (8) a few isolated locations there s no doubt about that
 (9) Q And you wouldn t disagree with this proposition would you
 (10) that it is entirely possible that in many of the areas in which
 (11) you took samples that prior to the time you took samples there
 (12) were doses of oil in the water column that may have been
 (13) sufficient to kill organisms in the water column?
 (14) A Well in aquatic toxicology there are two parts of aquatic
 (15) toxicology that make up the dose that s the concentration of
 (16) chemicals which is what we were measuring and the duration of
 (17) exposure and the two have to be combined and considered
 (18) together to estimate whether an organism would have been
 killed
 (19) by the oil spill before we got there to take our measurement
 (20) And the fact of the matter was we got out there as soon as
 (21) possible we can extrapolate back and I did that in my original
 (22) testimony here and so I think it s unlikely that there would
 (23) be many places that had high enough concentrations for long
 (24) enough to cause significant injury to aquatic life that was
 (25) existing there in Prince William Sound in late March of 1989

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- (1) Q That s a possibility
 (2) A A real possibility, yeah
 (3) Q I want to go into this briefly but we ve been into it
 (4) before You published at the ASTM conference?
 (5) A Yes I did
 (6) Q And you went through the same internal Exxon review that
 (7) other people have talked about with regard to your ASTM
 paper
 (8) you submitted it for review and the lawyers and public
 (9) relations took a look at your papers?
 (10) A I submitted it to the Exxon scientists and they distribute
 (11) it for review yes
 (12) Q I guess you pride yourself on the fact that you re a good
 (13) enough scientist with enough experience to where you think
 you
 (14) can design some pretty good studies I would bet?
 (15) A Correct
 (16) Q In fact a heck of a lot of fun - the fun isn't in
 (17) collecting the data the fun is in using your background and
 (18) your experience in the design of the study, and then at the end
 (19) the evaluation of the study results?
 (20) A That s correct
 (21) Q And the sort of grind of going out and collecting the data
 (22) is best left for what I make the young lawyers do, same -
 (23) it s the same drill Isn t that right?
 (24) A To some extent We used trained people though
 (25) Q I know you use trained people and I m not criticizing you

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- (1) for that
 (2) A But that s true yes
 (3) Q I want to talk - the reason I asked the questions is I
 (4) want to talk about the design or potential design of studies
 (5) That s where I m going I m not criticizing the people that
 (6) work for you okay?
 (7) A Okay
 (8) Q Now with regard to the potential design of studies you
 (9) did indeed do some preliminary design work and propose a
 study
 (10) called How Clean is Clean?
 (11) A That is correct That dealt with shoreline conditions
 (12) Q And would you tell the jury what the heck that study
 (13) composed of or was to be composed of?
 (14) MR LYNCH Your Honor I don t have any objection to
 (15) counsel generally inquiring of Dr Neff about subjects outside
 (16) the scope of direct but this seems to relate solely to the
 (17) shoreline cleanup issues which - on which Dr Neff was not
 (18) called and about which I did not ask him
 (19) MR O NEILL Deals with the general - he has studied
 (20) and talked generally about the entire ecology of Prince William
 (21) Sound and how it s healthy today and I am going to go through
 (22) a series of studies that he proposed that would have given us
 (23) better information and talk about what happened to those
 (24) studies So it s very relevant to his general conclusion
 (25) THE COURT There s a distinction though I take it

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- (1) that you re making between shorelines and -
 (2) MR LYNCH Dr Neff has done a lot of work relating
 (3) to shorelines and to cleanup activities and what was and
 (4) wasn t -
 (5) MR O NEILL I m not going to talk about the cleanup
 (6) if that s the concern I m going to talk about -
 (7) MR LYNCH How Clean is Clean is a study that relates
 (8) to whether the net environmental benefit of additional cleanup
 (9) activities was such as to justify the additional activities
 (10) Dr Neff has testified in direct as to what the content of the
 (11) water column was
 (12) THE COURT I sustain the objection
 (13) BY MR O NEILL
 (14) Q I ll move on to another study that you proposed concerning
 (15) sheens and sampling You studied the water?
 (16) A That s correct
 (17) Q And you proposed another study to Exxon to study oil
 sheens
 (18) to see whether the sheens at the top of the water presented
 (19) problems You wanted to investigate the sheen at the top of
 (20) the water?
 (21) A That is correct.
 (22) Q And part of the problem that we re looking at right here is
 (23) that the top of the water that little layer at the top of the
 (24) water is scientifically different than the water column?
 (25) A It s completely separate from the water column yes

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- (1) Q Then the bottom is another environment?
 (2) A That is correct
 (3) Q And with regard to sheen sampling there is indeed much scientific literature including studies done by Paul Boehm
 (4) another Exxon consultant which shows that toxics toxic materials tend to concentrate in the thin micro layer at the surface of the water?
 (5) A I don't believe Dr. Boehm did any studies on sheens but any way he summarized some previous studies
 (6) Q And there are - there's a whole group of micro animals little critters and bugs and things that we can't see and some that we can see that are associated with this thin interface?
 (7) A They're associated with the upper centimeters upper half an inch or so of the water yes
 (8) Q Many of these organisms to some extent form the fundamental building blocks of the food chain?
 (9) A I disagree with that I think quantitatively they're a very minor component of the food chain
 (10) Q There are indeed some stages of fish stages that live in the micro surfaces?
 (11) A They live just below
 (12) Q You proposed to Exxon to do a quantitative sheen study to determine if they are a potential hazard?
 (13) A That is correct
 (14) Q You had the special samplers available to take the samples?

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- (1) A Yes we did
 (2) Q Instead you did not do a quantitative study, isn't that right?
 (3) A That is correct
 (4) Q And that was Exxon's decision?
 (5) A That was Exxon's decision
 (6) Q Now you had written a paper concerning the long term impact of Amoco Cadiz crude oil on - what is this fish called again?
 (7) A Plaice
 (8) Q A plaice?
 (9) A Uh huh
 (10) Q In that paper you concluded this particular fish although not heavily damaged with oil shows serious histopathological biochemical damage?
 (11) A That's correct those are my words
 (12) Q Because of your Amoco Cadiz study, you recommended Exxon Corporation study the biochemical effects of the Exxon Valdez oil spill on fish that live in the lower part of the water column?
 (13) A That is correct
 (14) Q Now when some animals are exposed to toxins those toxins are converted to something else in the body before they're removed from the body and those are called metabolites?
 (15) A That is correct

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- (1) Q And you stated in your report on the Amoco Cadiz spill that the metabolites of hydrocarbons particularly PAH are more toxic than the parent compound?
 (2) A Some of them are yes
 (3) Q So when they get into the living organism they can be more toxic than when they're in the water?
 (4) A That's a possibility yes
 (5) Q And if a species of animal is fatty has a high fat content it tends to retain metabolites in the fat?
 (6) A Some of them are Most of them are water soluble and most are excreted quite rapidly
 (7) Q And some of the toxic metabolites have been demonstrated to bind to the DNA of salmon?
 (8) A That is true
 (9) Q And some metabolites can induce tumors?
 (10) A Some of the higher molecular weight polycyclic aromatics can induce tumor yeah
 (11) Q You wanted to study metabolites at the bottom of the water column and in August of '89 Exxon rejected your proposal?
 (12) A That is correct.
 (13) Q I want to discuss a couple of your exhibits and the one thing I didn't understand and you can explain it to me and this is a total filer I don't have it in your deposition - be assured whatever you say I can't do anything about it I don't have it in your deposition transcript or anything but I'm

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- (1) interested in this chart And my question is on the top chart that has Exxon and NOAA data?
 (2) A Correct
 (3) Q Are each of these points either an Exxon or a NOAA data point or are they - are they averages?
 (4) A No these are each individual data points individual water samples
 (5) Q Okay and - oh I get it the top one deals with PAHs and the bottom one deals with?
 (6) A VOAs yes
 (7) Q The volatiles?
 (8) A The benzene and stuff like that
 (9) Q Oh, I feel like an idiot probably not the first or last time And would it be fair to say that indeed there were places within the Sound where we did find PAH levels and volatile levels that exceeded the State requirements?
 (10) A That is correct
 (11) Q But the vast majority didn't exceed?
 (12) A That's correct only there are more than 800 samples there and only 10 exceeded the standard
 (13) Q With regard to the presence of these substances in the water we did find at least trace elements of PAHs and volatiles in a lot of different places?
 (14) A That's correct
 (15) Q And in all likelihood it is more probable than not that

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- (1) they were the result of the Exxon Valdez oil spill?
 (2) A I think most of them probably came from that There were
 (3) other sources but most probably came from the Exxon Valdez
 (4) Q And I was interested in this chart from Northwest Bay
 (5) which is there and at least in Northwest Bay with the Exxon
 (6) and the NOAA data with regard to PAHs we do get hits above
 the
 (7) ten parts per billion level?
 (8) A That s correct
 (9) Q And you talked for a while about mussels do you recall
 (10) that?
 (11) A That s correct
 (12) Q And at least in June of 1989 the caged mussel study showed
 (13) that these mussels were assimilating a good amount of PAHs?
 (14) A Mussels from some locations were like Snug Harbor and
 (15) Northwest Bay and so forth that s correct.
 (16) Q And 4 000 5 000 6,000 parts per billion?
 (17) A That s correct
 (18) Q Now I want to trace this through, and I may not understand
 (19) it and if I don't fix it, okay?
 (20) A Okay
 (21) Q But we talk about many of these animals or critters having
 (22) the ability to bioaccumulate in their tissues?
 (23) A That is correct
 (24) Q And at some point in time they die and they go to the
 (25) bottom?

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- (1) A Maybe yeah
 (2) Q Some do?
 (3) A Yeah
 (4) Q And at least in these kinds of situations they could
 (5) present a problem on occasion because you have the source
 you
 (6) have the poison you have the contaminant on the bottom in its
 (7) bioaccumulated stage and it could reemerge?
 (8) A That s true but the total amount that would reach the
 (9) bottom that way would be very small but that could occur I
 (10) agree
 (11) Q And indeed organic pollutants - or after the pollutants
 (12) have been absorbed into organic mechanisms and the oil can
 (13) reach much higher concentrations in sediments than in the
 water
 (14) column?
 (15) A That s often the case yes It s possible
 (16) Q And polycyclic aromatic hydrocarbons PAHs entering water
 (17) can become absorbed on organic or in organic particulate
 matter
 (18) and be deposited in the bottom?
 (19) A That can happen yes
 (20) Q Now we talked about the State of Alaska standards and we
 (21) talked about LD or LC 50 levels Acute toxicity data does not
 (22) adequately represent the potential impact of chronic low level
 (23) PAH contamination on aquatic organisms or ecosystems does
 it?
 (24) A That is correct sounds like a quote from something I
 (25) wrote

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- (1) Q Doctor I ll tell you a secret everybody else here knows
 (2) I am not smart enough to ask a novel question And I have a
 (3) sheet here that has a collection of things that you ve
 (4) written
 (5) A Okay
 (6) Q So it s no secret I m sure they told you that before you
 (7) came here
 (8) A No they didn t
 (9) Q That s how I know how to ask these questions I m probably
 (10) one of the few people in the world that has written most of
 (11) what you read -
 (12) A Read most of what I ve written
 (13) Q Or read most of what you written See it wasn t on the
 (14) outline I didn't have a chance did I?
 (15) And sublethal effects may be detrimental to the long term
 (16) survival of an organism in its normal environment?
 (17) A That is correct.
 (18) Q And chronic exposure to certain PAHs may induce mutation
 (19) and cancer in sensitive species?
 (20) A Yes but those aren t the ones that are most important in
 (21) petroleum
 (22) Q And your lab testing data did not include any long term
 (23) exposure data?
 (24) A Yes we did lots of long term tests sublethal effects
 (25) tests

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- (1) Q Did yours?
 (2) A Texas A & M University yes much of my research dealt with
 (3) long term effects
 (4) Q With regard to the Prince William Sound oil spill?
 (5) A Oh we used what EPA in their infinite wisdom called rapid
 (6) chronic tests now that s a contradiction in terms but
 (7) basically it s a shortened test that reflects what might happen
 (8) in a chronic exposure and we measure things like growth of the
 (9) fish and so forth and so these are accepted by EPA as
 (10) surrogates or replacements of tests that may last months so we
 (11) did those in the laboratory
 (12) Q You did rapid chronic tests in seven to ten days but you
 (13) did not do any tests that included in fact long term
 (14) exposure?
 (15) A No because EPA has accepted these rapid chronic tests as
 (16) adequate representation of chronic effects
 (17) Q With regard to the rapid tests would you agree with the
 (18) proposition that in some cases such as with fish that may live
 (19) several years, it is harder to determine if you are missing
 (20) something with the rapid chronic tests?
 (21) A They re not perfect, but they re a reasonable surrogate
 (22) given the time constraints, but yes you can always miss
 (23) something
 (24) Q Would you agree generally with the proposition that
 (25) abundance of certain species in the intertidal ecosystem can

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- (1) produce substantial and direct and indirect effects on other
 (2) species?
 (3) A That can have an effect yes
 (4) Q And the oil spill represented a substantial disturbance to
 (5) the intertidal rocky shores which set back the community
 (6) structure and successional stages to an earlier less complex
 (7) stage and the succession back to prespill is still going on?
 (8) A That sounds like another quote that I made in like 1990 and
 (9) I agree that that was true in 1990
 (10) Q Would you believe that bio - there is your deposition
 (11) transcript Would you believe that bioaccumulation and direct
 (12) exposure probably kill fish at all levels of the water column
 (13) and primarily at the upper and lower levels of the water
 (14) column?
 (15) A I ve already said in my direct testimony that some animals
 (16) were killed by the oil spill
 (17) Q And again it s possible that some juvenile salmon could
 (18) have been because they stay in close to the shore?
 (19) A That is correct in a few isolated cases I think probably
 (20) some juvenile salmon did die
 (21) Q Would you agree with the proposition that eggs and larval
 (22) stages of most marine organisms are the most sensitive to
 (23) hydrocarbons?
 (24) A That seems to be the case particularly the early life
 (25) stages after the egg stage

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- (1) Q You gave some testimony about herring and salmon first
 (2) herring and then with salmon and whether in fact they
 (3) coexisted at certain times with the oil in the water column or
 (4) the oil on the top?
 (5) A That s correct
 (6) Q That s a gross -
 (7) A Right correct
 (8) Q - summary but would it be fair to say that in point of
 (9) fact you don t know?
 (10) A In the case of the herring spawning in the intertidal zone
 (11) we have pretty good indications of where the oil was and where
 (12) the herring spawned That s easy because you can go out
 (13) there
 (14) and walk the shore and see where the oil is and see where the
 (15) herring spawned and so I think our estimates there are very
 (16) good There was very extensive monitoring of what are called
 (17) the anadromous streams these are salmon streams after the
 (18) spill So we know which streams were oiled and which were
 (19) not
 (20) and so I think we have a pretty good picture we know where the
 (21) salmon are and we know where the oil is so I think we have a
 (22) reasonably good picture of where they occurred
 (23) Q How about the salmon?
 (24) A I talked about the salmon the salmon streams we know
 (25) which
 (26) ones were oiled and which ones were not
 (27) Q Let s just take a look Have you ever seen this picture
 (28) before?

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- (1) A No I have not to my knowledge At least in that form
 (2) Q The pictures purport to depict you can agree with it or
 (3) not agree with it herring spawning beaches and attempts to
 (4) quantify with herring spawning beaches by kilometer a lot of
 (5) different herring spawning areas do you see that?
 (6) A Yes I do
 (7) Q Does this at least from your experience reflect the
 (8) situation in Prince William Sound?
 (9) MR LYNCH 1989?
 (10) BY MR O NEILL
 (11) Q In 1989?
 (12) A What it shows as best I can read here it s a little fuzzy
 (13) is it shows where the herring zone the different zones I
 (14) think the circles are different zones The investigator used
 (15) to breakdown the total spawn in the different areas and shows
 (16) kilometers of spawn That s the length of shoreline and along
 (17) which herring spawn, so it seems it s consistent with what I
 (18) showed earlier in my testimony
 (19) Q And we have almost - almost 60 miles 60 kilometers
 (20) metric miles of herring spawning beaches that were in the oil
 (21) spill area isn t that right?
 (22) A That is correct but only a small fraction of the shoreline
 (23) in that area was actually oiled
 (24) Q And we saw the videotape of the oil down on - was it kelp
 (25) or was it -

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- (1) A It looked like fucus or rockweed to me yes
 (2) Q Fucus okay And if indeed herring spawned on kelp that we
 (3) saw in the videotape we could at least agree in general terms
 (4) that that is not a good thing for that herring spawn is that
 (5) right?
 (6) A Those will probably be pretty unhappy herring eggs yes
 (7) They probably would not make it Some of them anyway
 (8) MR O NEILL. Thank you Doctor I have no further
 (9) questions
 (10) MR LYNCH Do you have that chart of the Northwest
 (11) Bay?
 (12) MR O NEILL. Of what?
 (13) MR LYNCH Northwest Bay chart that you showed?
 (14) REDIRECT EXAMINATION OF JERRY NEFF
 (15) BY MR LYNCH
 (16) Q Dr Neff first of all let s try to clear up one thing
 (17) about the last subject you discussed with Mr O Neill He
 (18) showed you a map of places in Prince William Sound where the
 (19) herring spawned in 1989
 (20) A That is correct
 (21) Q Are herring like salmon do they always return to the same
 (22) beach to spawn?
 (23) A We don t know for sure but there s very strong evidence
 (24) that they don t have what s called site fidelity They don t
 (25) come back to the same place each time that s why the miles of

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- (1) herring spawn have to be monitored each year because the
 (2) herring spawn wherever they seem to feel like and it varies
 (3) from year to year. Some places there's a lot of herring spawn
 (4) one year and no herring there the next year and they're
 (5) spawning someplace else. It looks like the adults do not come
 (6) back to the same place each year to spawn.
 (7) Q So when we talk about herring spawn beaches we're talking
 (8) about the beaches where the herring chose to spawn in 1989?
 (9) A That is correct.
 (10) Q And you said you could match that with the oiling data you
 (11) were referring to the 1989 oiling information. Is that correct?
 (12) A That is correct.
 (13) Q Now just a minor point, do you know what the disagreement
 (14) was that Drs. Houghton and Laes had with Exxon?
 (15) A No, I do not know.
 (16) Q Do you know whether or not it related to the fact they
 (17) thought the beaches should not be cleaned because it was
 (18) biologically to let nature cure itself?
 (19) A I know that was one of the issues and that's what they've
 (20) published extensively on since their departing the Exxon fold.
 (21) Q Their objection was to cleaning the beaches they wanted to
 (22) leave the oil there?
 (23) A That was - yes, that was a concern for everyone. At what
 (24) point do you stop cleaning up and let nature do its thing?
 (25) Q And just so the record is clear, did you not take good

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- (1) solid detailed notes of your work on this water sampling?
 (2) A We were never asked not to keep records of our scientific
 (3) findings. What we were asked to do is not have memo wars or
 (4) whatever you want to call them, memos back and forth among
 (5) scientists arguing trivial points and so forth, and so we were
 (6) asked to keep that, use the phone, don't use the fax machine
 (7) basically, but we were actually - the scientist can't do
 (8) research without taking notes. I mean, I can't remember
 (9) everything in my head. I need to keep records and it's
 (10) particularly important if there is - it's litigation
 (11) sensitive. We have to have very complete records of all of our
 (12) scientific data.
 (13) Q And you do?
 (14) A We do.
 (15) Q And Mr. O'Neill and his colleagues got those notes, didn't
 (16) they?
 (17) A Yes.
 (18) Q They got a chance to depose you for nine days?
 (19) A Eight days. I think it was. Seemed like nine.
 (20) Q Now with respect to chronic exposure and sublethal
 (21) effects that has been studied in the laboratory extensively,
 (22) hasn't it?
 (23) A Very extensively.
 (24) Q Dr. Rice for example has spent a great deal of time
 (25) studying that as to Alaska species, is that correct?

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- (1) A That is correct.
 (2) Q And in setting the ten parts per billion factor in the
 (3) State of Alaska they took account of that literature?
 (4) A Yes, it's critical in doing criteria or standards that both
 (5) acute and chronic effects being considered completely, yes.
 (6) Q When you spoke about chronic exposure possibly producing
 (7) sublethal effects, you were referring to exposures that would
 (8) be high enough to cause sublethal effects?
 (9) A Exactly, yes.
 (10) Q And it is the consensus of the State and scientific
 (11) community that levels as low as we've been talking about today
 (12) ten parts per billion would be far below the level at which
 (13) chronic sublethal effects that is adverse effects from
 (14) exposure would occur?
 (15) A Yes, a fish could live its whole life in water with ten
 (16) parts per billion aromatic hydrocarbons and never suffer any
 (17) bad effects.
 (18) Q All the detritus, whatever might be in the water could
 (19) float to the bottom, would that cause adverse effects?
 (20) A It's unlikely that it would, it's just not enough.
 (21) Q What's the basic reason for the conclusion that free
 (22) swimming fish were not hurt in this oil spill as they have not
 (23) been hurt in other oil spills around the world?
 (24) A Because exposure is very low, very little oil gets into the
 (25) water. The old adage that oil and water don't mix is basically

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- (1) true. Chemists are just getting too darn good. They can
 (2) measure vanishing low concentrations in the water column, but
 (3) these concentrations don't have any effect so our extensive
 (4) water quality monitoring showed that the water quality was very
 (5) good and adequate for the support of fish and the food that
 (6) they rely on.
 (7) Q Now, lastly I'd like to ask you about DX8760, which was a
 (8) chart for Northwest Bay. Could you - you were asked about
 (9) that, so could you just explain what that chart shows?
 (10) A Okay. Actually, the data from this chart was shown in one
 (11) that we had in the examination that was of salmon migration
 (12) routes.
 (13) Q We showed a different -
 (14) A Very same -
 (15) Q Showed a different chart but the same information?
 (16) A It's just a smaller subset of the data and these points
 (17) above, above the State of Alaska standard line were shown in
 (18) that chart, and I explained that that was during shoreline
 (19) cleanup in Northwest Bay. There was a major cleanup effort
 (20) there. There was a lot of oil on the shore. We monitored
 (21) offshore water quality during that cleanup and showed that for
 (22) a very short period of time during cleanup, there were
 (23) concentrations in excess of the State standard.
 (24) Q And for a very short time, are we talking hours, we talking
 (25) days, we talking -

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- (1) A Probably a day or less because we only sampled once a
 (2) day when we were monitoring these kinds of things
 (3) Q When you went back the next day you didn't have that?
 (4) A That's right
 (5) Q So it's conceivable that if 30 parts per billion could
 (6) cause a problem for that one day if there happened to be fish
 (7) there they might have had some adverse effects?
 (8) A There might have been a few critters that yeah didn't
 (9) like 30 parts per billion for one day yes that could have
 (10) some effects
 (11) Q And at a population level in terms of the concerns that
 (12) Mr O'Neill's clients have to catch as many of those fish in
 (13) nets as they possibly can what kind of consequence could that
 (14) have on herring and pink salmon?
 (15) A At most a few individuals might have been affected and
 (16) that would have no effect on the population everyone within
 (17) Northwest Bay
 (18) Q You also talked with Mr O'Neill very briefly about the
 (19) very very surface of the water the first centimeter or
 (20) something like that?
 (21) A That is correct yeah the top micro layer as it's called
 (22) Q Now the species that we're talking about here in this case
 (23) salmon herring do those fish lay their eggs in that - in
 (24) that one centimeter?
 (25) A No they do not

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- (1) Q And does that centimeter have anything to do with an
 (2) evaluation of the likely effect of oil on herring and pink
 (3) salmon?
 (4) A Well the herring larvae after they hatch spend a short
 (5) period of time about 10 days near the water surface It's
 (6) been my contention for many years that there's always a layer
 (7) of water between them and that micro layer The micro layer is
 (8) composed of materials that will not go into solution in the
 (9) water that's why they're on the surface And the physics of
 (10) that is very well known and there's always a layer of water
 (11) between any organism floating up against that and the layer
 (12) itself otherwise herring larvae in places like Puget Sound
 (13) would all die because the micro layer contains lots of
 (14) chemicals from airborne deposition and so forth so the micro
 (15) layer contains concentration of chemicals but I don't think
 (16) organisms are ordinarily exposed to them
 (17) Q So insofar as your analysis of this spill on herring and
 (18) all their life stages did you need to study the micro layer to
 (19) reach the conclusions that you gave the jury today?
 (20) A No And the second reason is because by the time the
 (21) herring were hatching which is about 20 days after their eggs
 (22) were deposited the eggs were deposited in April so we're
 (23) talking about May 1989 That satellite photo taken in April
 (24) shows very clearly that there were very few slicks or sheens on
 (25) the water surface in May and June and so forth There were

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- (1) scattered sheens but the likelihood of herring larva coming up
 (2) right under a sheen was very remote because all the herring
 (3) spawned in the upper northeast corner of the Sound and that's
 (4) where the oil had left first where the oil left first so
 (5) there wasn't any overlap between their exposure
 (6) Q These little guppy size fish would have had to swim about
 (7) 35 miles to the nearest -
 (8) A Exactly
 (9) MR LYNCH Thank you Doctor
 (10) THE COURT Thank you sir You may step down You
 (11) may call your next witness
 (12) MR COOPER Your Honor defendants will call
 (13) professor any Brannon
 (14) THE CLERK. Raise your right hand please sir
 (15) (The Witness is Sworn)
 (16) THE CLERK. Please be seated For the record sir,
 (17) state your full name your address and spell your last name
 (18) please
 (19) A Ernest Leroy Brannon University of Idaho P O Box 8943
 (20) Moscow Idaho Zip code 43843 B R A N N O - N
 (21) THE CLERK. Thank you sir
 (22) DIRECT EXAMINATION OF DR ERNEST BRANNON
 (23) BY MR COOPER
 (24) Q Good morning Dr Brannon Dr Brannon can you tell us
 (25) what your current employment is?

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- (1) A I'm a professor at the University of Idaho in fisheries
 (2) science and aquaculture
 (3) Q Are you tenured?
 (4) A Yes I am
 (5) Q That means they can't fire you?
 (6) A Hopefully not
 (7) Q And do you have any other positions at the University of
 (8) Idaho?
 (9) A I'm the director of the aquaculture research institute
 (10) Q Can you explain briefly what that institute is?
 (11) A The aquaculture institute was started by the University of
 (12) Idaho in 1988 to provide extension and educational services to
 (13) the aquaculture industry in Idaho That would include both the
 (14) trout farmers in Idaho and the conservation hatcheries that
 (15) produce salmon for the Columbia River fishery and sport
 (16) fishery
 (17) Q Let's talk a moment about your education Can you describe
 (18) your educational background?
 (19) A The academic?
 (20) Q Yes let's -
 (21) A I started in 1955 at the University of Washington and
 (22) completed my bachelor's degree in 1959
 (23) Q And that was a bachelor's degree in what?
 (24) A In fisheries
 (25) Q All right I interrupted you

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- (1) A I went to work for a federal agency in fisheries and
 (2) returned about 1966 for graduate studies and finished my
 Ph D
 (3) in fisheries with the - with my Ph D thesis in fish genetics
 (4) behavior in 1972
 (5) Q Now when you were a youth were you involved with
 (6) fisheries or hatcheries?
 (7) A Yes I was one of those rare people raised at a salmon
 (8) hatchery
 (9) Q And your father was involved in the hatchery operation?
 (10) A He was an employee of the Washington State Department of
 (11) Fisheries and I was - had the good fortune of helping him
 (12) Q This is kind of a case of not a river running through it
 (13) but a hatchery running through it. All right, I think you
 (14) mentioned already that you had worked for a fishery
 commission
 (15) at some point during your course of your education?
 (16) A Yes
 (17) Q Was that the International Pacific Salmon Fishery
 (18) Commission?
 (19) A That's correct
 (20) Q And that's in British Columbia?
 (21) A The headquarters in British Columbia or were in British
 (22) Columbia
 (23) Q Can you describe what that commission the name of which
 (24) I'll never be able to repeat twice in the same way?
 (25) A The salmon commission was developed by treaty between

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- (1) Canada and the United States and their objective was to
 manage
 (2) the sockeye and pink salmon fishery between the two countries
 (3) because both countries fish extensively on it and to share
 (4) responsibility for enhancement in management and prevent fish
 (5) wars The salmon commission was formed to regulate and
 manage
 (6) that fishery
 (7) Q And if I read the newspaper correctly lately I guess some
 (8) of those fish wars are beginning to break out again?
 (9) A That's correct because that salmon commission was
 (10) eliminated for the new treaty and the new treaty just hasn't
 (11) been good enough
 (12) Q That probably doesn't have a whole lot to do with what
 (13) we're here to talk about, so let me move on here Let's see
 (14) when you were at the - at that commission you - maybe you
 (15) already said this but you ultimately became the chief
 (16) biologist for that organization?
 (17) A Yes I started actually in high school working during the
 (18) summers for them and worked up through a university career
 and
 (19) was involved in field initially then research, and finally I
 (20) was promoted to the chief research biologist for the salmon
 (21) commission
 (22) Q Do you have other experience, work experience in the area
 (23) of fish biology?
 (24) A Well my - my work experience when I left the salmon
 (25) commission and took a position at the University of Washington,

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- (1) my responsibility was to research fish culture and subjects
 (2) associated with fisheries management
 (3) Q And let's see for a while you were the director of the
 (4) Fin Fish Aquaculture Program at the University of Washington?
 (5) A Yes I was
 (6) Q Briefly what was that program involving?
 (7) A That was a hatchery program teaching undergraduates and
 (8) graduate students about fish culture and researching factors
 (9) that affect the culture of fish such as fish new transition
 (10) of management schemes those issues
 (11) Q Now let's see you were - you were awarded an endowed
 (12) share at University of Washington?
 (13) A Yes I received the Keiler Foundation (ph) endowed share
 (14) for work we were doing in the Lake Washington Puget Sound
 area
 (15) with regards to salmon and trout fisheries
 (16) Q All right, let me talk for a moment or have you talk for a
 (17) moment about professional associations Do you belong to any
 (18) professional associations?
 (19) A I'm a member of the American Fisheries Society and member
 (20) of the Pacific Fisheries Biologists The others are either
 (21) academic or not related to fisheries
 (22) Q This Western Regional Aquaculture Center that you
 mentioned
 (23) at the outset that's the one that's affiliated with the
 (24) University of Idaho, do I have that right?
 (25) A No the Western Regional Aquaculture consortium or center

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- (1) is 12 western states including Alaska and I'm on the board of
 (2) that, and we identify dollars that come from the department of
 (3) agriculture U S Department of Agriculture and direct those
 (4) to projects that will enhance our understanding of aquaculture
 (5) Q You were chairman of the board of directors of that
 (6) organization for ten or so years?
 (7) A I was actually board chair for only two years It's a
 (8) rotating chair
 (9) Q Now, did you - were you involved in your role in that
 (10) organization in evaluating proposals for research that had to
 (11) do with Alaska?
 (12) A Well, the requirements were requirement of all proposals
 (13) they have at least two states, institutions from two states
 (14) involved and Alaska has been involved in of course several of
 (15) them
 (16) Q Let's see, how about the advisory role do you serve in an
 (17) advisory role to any organizations or groups?
 (18) A Yes that's part of my responsibility at the University of
 (19) Idaho and one of my responsibilities that I assumed when at the
 (20) University of Washington
 (21) Q How about with respect to the Pacific Marine Fisheries
 (22) council do you advise any members of that organization?
 (23) A Yes, I advise the Idaho delegation that's involved with the
 (24) Pacific Fisheries management council
 (25) Q And what does that council basically do?

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- (1) A Well they look at the - at the management regulations
 (2) that are being imposed especially as it identifies the species
 (3) that come back into the Columbia River and so I advise them
 (4) with regards to how those management decisions might impact
 (5) those populations
 (6) Q Let s see you ve also been an advisor with respect to
 (7) trout unlimited?
 (8) A Yes I have been
 (9) Q That s a sport fishing organization?
 (10) A Yes that s correct
 (11) Q Northwest Steelhead and Salmon Council?
 (12) A Yes
 (13) Q That s also a sport fishing organization?
 (14) A That s correct
 (15) Q Pacific Trollers Corporation?
 (16) A That s of course a commercial fishing group, small boat
 (17) owners
 (18) Q That s involved with coho salmon?
 (19) A Anything that can troll for chinook primarily and coho
 (20) yes
 (21) Q And you ve been - served in an advisory role with respect
 (22) to the Puget Sound Gillnetters Association?
 (23) A Yes I have
 (24) Q That s obviously a commercial fishery?
 (25) A Yes

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- (1) Q How about Native American Tribes have you been involved
 in
 (2) any advisory roles with respect to fishery issues in the Native
 (3) American Tribes?
 (4) A We ve both at University of Idaho and University of
 (5) Washington have extended a fair amount of extension activities
 (6) to the tribes to involve them more in fisheries management and
 (7) so I ve advised at least eight or ten tribes primarily with
 (8) regards to their hatchery developments and enhancement
 (9) programs and less in the area of management
 (10) Q And you ve also served as consultant for the Bonneville
 (11) Power Administration?
 (12) A Yes I have
 (13) Q Just very briefly what kind of consulting work?
 (14) A That has dealt with how to look at recovery measures of
 (15) sockeye salmon on the Columbia River They re listed as an
 (16) endangered species and management has to take some fairly
 (17) careful approaches to try to recover that population
 (18) Q How about the City of Seattle have you done consulting
 (19) work for the city?
 (20) A City of Seattle has been involved with the sockeye spotting
 (21) channel on Lake Washington to help recover the sockeye
 (22) salmon
 (23) in that system
 (24) Q Let s see you ve done some studies pursuant to grants
 (25) academic studies research studies pursuant to grants for the
 United States government?

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- (1) A Yes I have and those have been related primarily to
 (2) behavior of salmon migration homing behavior those kinds of
 (3) subjects
 (4) Q You did some work for the National Science Foundation in
 (5) 1986?
 (6) A Yes
 (7) Q That involved coho salmon?
 (8) A Yes we tried to look at the phenomena of imprinting on
 (9) home stream motors how does a fish find its way back to home
 (10) stream and we were looking at that fishery
 (11) Q 25 words or less how does a fish find its way back?
 (12) A It smells its way home
 (13) Q All right that s less than 25 words U S Department of
 (14) Commerce sea grant effort have studied chinook salmon
 (15) return
 (16) survival for that organization?
 (17) A Yes we looked at where the salmon go based on tags after
 (18) release and their survival
 (19) Q You ve also done work for the American Petroleum Institute
 (20) that was mentioned here earlier in court today?
 (21) A Yes
 (22) Q What kind of work have you done for the American Petroleum
 (23) Institute?
 (24) A Well at the University of Washington we re concerned of
 (25) course about oil shipping in Puget Sound with the potential
 that there might be an oil spill and so we looked at issues

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- (1) that were related to how salmon might respond to an oil spill
 (2) in terms of the migratory pathways
 (3) Q Let s see you ve received some awards for your work in
 (4) enhancement and sport fishery work involving salmon?
 (5) A These were more awards of appreciation or recognition
 (6) conservationists-of the-year type of awards yes
 (7) Q Those include from the United States Navy looks like I
 (8) threw you for a loop I had ultrasonic testing systems?
 (9) A Yes that wasn t an award that was a volunteer advisory
 (10) role
 (11) Q I see Conservationist-of the-year award Puget Sound
 (12) anglers?
 (13) A Yes
 (14) Q Outstanding publication award in fish ecology and
 (15) management from the wildlife society?
 (16) A That was the first work done to show that genetics are very
 (17) strongly involved in homing or migratory behavior of small
 (18) fish
 (19) Q Let s turn for a moment to some publications Have you
 (20) published in learned treatises?
 (21) A Them yes and some gray literature government reports
 (22) Q You have published scientific articles?
 (23) A Yes I have
 (24) Q About how many?
 (25) A Probably about 60

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- (1) Q And some or all of these were subject to the full peer review process?
- (2) A Most of them were peer reviewed
- (3) Q Some of the topics include the salmon spawning time in relation to stream temperatures and fry emergence?
- (4) A Yes much of it was early life history type questions
- (5) Q Origin and development of life history patterns in Pacific salmonid?
- (6) A Yes
- (7) Q Factors affecting sockeye salmon growth in four lakes of the Fraser River system?
- (8) A Yes
- (9) Q And others?
- (10) A Yes
- (11) Q Now Dr Brannon have you worked before you were engaged on this case on salmon systems in Alaska?
- (12) A Before this case no I have not.
- (13) Q Now you've obviously worked on that subject for the last four years since the spill?
- (14) A Yes
- (15) Q Do you feel that the fact that you hadn't studied Alaskan salmon systems for some reason makes you unable to discuss the kinds of things you're going to be talking about today with respect to some of the fisheries areas in Alaska?
- (16) A No not at all

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- (1) Q The basic principals tend to be the same?
- (2) A Well with the salmon commission we certainly were concerned about pink salmon and sockeye salmon life history and used Alaska data Washington data as well as British Columbia data to look at how we might alter our management programs and certainly their life histories are very very similar
- (3) Q Now you have studied work and you've mentioned some of it but you have done work in the area of the impacts of effect of hydrocarbons on salmon?
- (4) A Yes I did
- (5) MR COOPER Your Honor we would tender Dr Brannon as an expert in the area of salmon biology behavior, including the effects of oil on salmon
- (6) MR JAMIN No objection, Your Honor
- (7) THE COURT Did I hear no objection?
- (8) MR JAMIN No objection
- (9) THE COURT Thank you -Dr Brannon's qualifications are accepted and why don't we take our break at this point. We'll be in recess for 15 minutes
- (10) (Jury out at 12 00 p m)
- (11) (Recess taken from 12 00 p m to 12 15 p m)
- (12) (Jury in at 12 16 p m)
- (13) BY MR COOPER
- (14) Q Dr Brannon now you were asked to do some work by Exxon in connection with this litigation is that right?

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- (1) A I'm sorry I didn't hear the last part
- (2) Q You were asked to do some work for Exxon in connection with this litigation right?
- (3) A Yes I was
- (4) Q Can you just explain briefly how you came to be contacted and what that initial contact was?
- (5) A I believe the initial contact was from Dames & Moore who was a consultant for the field work with Exxon They asked me to be their procedures manual reviewer This would be the - the experimental plan they were planning to execute on the streams or wherever they're going to be investigating pink salmon and there would be a manual that would identify the procedure they were to follow and Dames & Moore asked me to review those manuals They would send them to me periodically I believe I reviewed three or four and after that just before the - this would have been right after the oil spill for the next couple months I believe
- (6) Then I was contacted by Wolfgang Kunkel from Exxon asked if I would be a researcher for them In fact I believe I was contacted by Bogle & Gates before that
- (7) Q In any event, you were asked to change to assume a different role or a new role?
- (8) A Yes I don't believe Bogle & Gates was really aware that I was a procedures manual reviewer
- (9) Q Did you ultimately then agree to expand your role?

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- (1) A Yes I did Make it short and simple, I did
- (2) Q What role did you have at that point?
- (3) A I was then asked to develop the pink salmon studies to look at the potential impact of oil in Prince William Sound on pink salmon
- (4) Q And was there an organization by the name of Pentec that was involved when you stepped into this role?
- (5) A Yes
- (6) Q Did you review some of the work that they had done?
- (7) A I was reviewing manuals they were doing They were the only ones that actually I reviewed
- (8) Q And did you have - well did you have any problems with the work that Pentec was doing?
- (9) A Well, I had no problems with the work they were doing I made suggestions how they should alter their procedures in a couple cases
- (10) Q Some of the procedures you thought were - could be better?
- (11) A Well, I felt that some of the things weren't - you weren't able to assess the impact of oil by what they were doing
- (12) Q Can you give an example of that?
- (13) A Well, in one case they were enumerating fry from the upper part of the stream that had no application to the affect of oil
- (14) Q Because the oil doesn't reach in the upper part of the streams?

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- (1) A Yeah the oil wouldn't reach the upper part of the stream
 (2) of course
 (3) Q And when you came on board did you undertake to design
 and
 (4) develop a suite of studies yourself?
 (5) A Yes I did I was asked to develop a set of studies that
 (6) would satisfy me with regards to the potential effect of oil
 (7) and I set out to do that I made up my - my study plan and
 (8) then sent that down to Exxon for their review
 (9) Q Now did you have - did you have pretty much a free hand
 (10) in doing what you wanted to do to accomplish this review?
 (11) A Oh yes That was one of the preconditions that - that
 (12) there be no influence from Exxon in terms of what studies would
 (13) be done how they would be done certainly I couldn't do all
 (14) the field work by any means so they would provide the
 (15) personnel the contract which was Dames & Moore, for the field
 (16) work and also provide me the scientists that I would work with
 (17) and they were not Exxon scientists but consultants like myself
 (18) that would be doing the field work
 (19) Q This was kind of the deal you cut at the outset that you
 (20) would be free to do these things?
 (21) A That's right
 (22) Q Let me ask you if - let's approach it this way There
 (23) were - as I understand it basically three or so approaches that
 (24) you have taken in looking at this question of the effect of the
 (25) oil spill on pink salmon in Prince William Sound?

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- (1) A Yes in terms of the - of my evaluation of impact I
 (2) looked at three general approaches
 (3) Q Can you tell us what the first general approach is just
 (4) generally?
 (5) A Well the first one was to look simply at the response of
 (6) the adults coming back into the Sound if there was an oil
 (7) impact I would have expected to see it in the adult returns of
 (8) those fish who were at risk and that was - the first approach
 (9) is look at the adult return or what I might call the harvest of
 (10) pink salmon
 (11) Q Just the simple concept of seeing how well the fish that
 (12) were really potentially exposed did?
 (13) A Yeah straightforward kind of evaluation
 (14) Q And then what was your second approach that you used?
 (15) A Well again the second approach was to look at the - if
 (16) there had to be an effect from oil then it had to be through
 (17) some kind of a mechanism in other words what they had to be
 (18) exposed to so I looked at the percentage of fish that were
 (19) exposed to oil in Prince William Sound - pardon me the
 (20) percentage of pink salmon exposed to oil in Prince William
 (21) Sound
 (22) Q We've got how well the fish did that were most potentially
 (23) exposed looking at how many were actually exposed and then
 (24) what was the third?
 (25) A The third area dealt with the science and that was what I

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- (1) spoke of earlier designing a bank of studies that I could
 (2) examine the most critical stages that I felt would be most
 (3) susceptible to oil and those results then would - would give
 (4) me the insight that I needed with regards to potential impact
 (5) that various stages
 (6) Q All right Now I guess one of the things I've learned is
 (7) that kind of underlying all of this you have to understand what
 (8) the life cycle of a pink salmon is is that a fair statement?
 (9) A That's right Many pink salmon have a simple life history
 (10) but it's not characteristic of other salmon or salmonids
 (11) Q I think we've got a large poster board we can use in order
 (12) to deal with the subject of life cycle of pink salmon?
 (13) MR COOPER Could I inquire if the jury could all see
 (14) that?
 (15) BY MR COOPER
 (16) Q All right we've got kind of a busy looking chart here
 (17) Dr Brannon but could you - well, let's - I tell you what
 (18) let's start at the top Can you start there and tell us what
 (19) this is depicting? And maybe we ought to start with this
 (20) fellow right here or this lady right here I guess
 (21) A Okay, that would be the returning pink salmon of the 1988
 (22) brood year That would be - the brood year is defined as the
 (23) year of spawning and so the 1988 brood year is of concern
 (24) because they had exposure later in their life history but the
 (25) adult comes back in 1988 and enters the Prince William Sound

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- (1) goes up to the home stream and spawns
 (2) Q So it produces the eggs here?
 (3) A That's right She'll deposit the eggs Pink salmon have
 (4) from 1200 to 1700 eggs per female They'll dig down in the
 (5) nests have several nests actually but all within a local area
 (6) called a redd R E D-D and that is the nest site she defends
 (7) against other fish coming in until she dies and she'll die
 (8) usually within a few days after spawning
 (9) Q So shortly after the spawn then the parent fish die both
 (10) the males and females?
 (11) A Both male and female die after spawning
 (12) Q What happens with the eggs in the redd or the nest?
 (13) A The eggs will incubate just like little banty eggs or
 (14) chicken eggs They'll hatch out usually within a couple three
 (15) months but by the middle of November most of the eggs have
 (16) hatched the female has spawned and now since they've
 (17) hatched they're now able to move around a little bit and that gives
 (18) them great access to better water if they're - if oxygen is
 (19) low from too many fish utilizing the site Being able to move
 (20) around can get them a little bit better incubation spot
 (21) Q These are these fellows?
 (22) A That's right they're yolk sac fry or alevins and they'll
 (23) remain at that stage until they leave the gravel which we call
 (24) emergence in the spring of the year
 (25) Q Let me stop you there for a moment if I can We've got

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- (1) this line on here that says - this vertical line that says oil
 (2) spill This is - we re trying to depict the time of the oil
 (3) spill in March 1989?
 (4) A Yes for the 88 brood the alevins and the eggs and the
 (5) adults of course missed - they were too soon for the oil
 (6) spill but the alevins that were just about ready to absorb
 (7) their yolk and become what we call fry the fry leave the
 (8) gravel now and go to the Sound to start feeding in the marine
 (9) environment Pink salmon unlike other trout and other salmon
 (10) don t feed in fresh water They go directly to the marine
 (11) environment
 (12) Q So this is - this portion of the life cycle?
 (13) A Yes And so then they will then go into the marine
 (14) environment and stay in Prince William Sound a few months
 (15) again from April till about August, and then they take off on
 (16) their long ocean migration and go counterclockwise around the
 (17) Pacific Ocean or the North Pacific Ocean and then back up the
 (18) Pacific coast of British Columbia and Alaska and back to their
 (19) home streams in Prince William Sound
 (20) Q So these are the - after they ve done this gyre around the
 (21) North Pacific they come back to the northern streams?
 (22) A Yes that s the even year run The 1988 produces the 1990
 (23) spawners and they produce the 1992 and so forth
 (24) Q Eve y two years basically you ve got another cycle
 (25) start:

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- (1) A Yes
 (2) Q Now what happens in the other years in the in between
 (3) years or the odd years?
 (4) A Well there we have the odd year run and because pink
 (5) salmon are just two-year-old fish they never mix Sockeye
 (6) chinook salmon coho and even chum salmon have intermixing
 (7) year
 (8) classes they come back at ages three four five six and
 (9) they can spawn with one another So the year classes mix but
 (10) in cases of pink salmon the even and the odd year classes
 (11) never mix they stay separate so the -
 (12) Q That means that for instance the spawners coming in in
 (13) 1989 would come in a year later after these spawners would
 (14) come
 (15) in?
 (16) A That s right with the exception of them being the same
 (17) species they re absolutely unrelated genetically to the even
 (18) year run And the odd year run now came in after the oil
 (19) spill so the adults have come in a few months after the event
 (20) of the spill
 (21) Q About when do they - when would these adults in 1989 have
 (22) entered the Sound in order to start spawning?
 (23) A They ll be coming back just about now June and July They
 (24) will - the earlier ones will be back already coming into
 (25) Prince William Sound Those going to cold streams will be
 back
 (26) and ready to spawn before too long but the bulk of the run
 (27) will come in a little bit later than that and they ll be

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- (1) spawning Then in this case in 1989 they will be spawning in
 (2) those streams that had been oiled or of those streams that had
 (3) been oiled they would be spawning in those and -
 (4) Q All of them or just some of them are you talking about?
 (5) A Well the 1989 population coming back in Prince William
 (6) Sound will be spawning all of them will be spawning A
 (7) segment of them will be spawning in oiled streams
 (8) Q And we ll come to that
 (9) A Yeah So they ll deposit their eggs August September
 (10) maybe even a little bit into October some of the late fish
 (11) And -
 (12) Q Well -
 (13) A They ll start their incubation period at that time
 (14) Q Where in the streams do they deposit their eggs what
 (15) portion of the streams?
 (16) A Well all salmon require fresh water to irrigate their
 (17) nests and so they all spawn associated with fresh water In
 (18) Prince William Sound this particular population of pink salmon
 (19) spawn in the intertidal area as well as the area above the
 (20) tidal area so about 50 percent of the population spawns
 (21) upstream and about 50 percent spawn below in the intertidal
 (22) area between the low tide and high tide but in that section of
 (23) stream that s irrigating the fresh water down through the
 (24) redds
 (25) Q We ve been talking about wild stock salmon or wild salmon?

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- (1) A Yes this is wild stock
 (2) Q There s also another large bunch of salmon in Prince
 (3) William Sound pink salmon that s not wild stock?
 (4) A They all came from wild stock in Prince William Sound but
 (5) the hatcheries developed their own populations from those and
 (6) now we ve got a substantial segment of pink salmon in Prince
 (7) William Sound being produced by the hatcheries and the
 (8) remainder being produced by the wild populations
 (9) Q Let me see if I can bring up have Exhibit 5120 Maybe I
 (10) can maybe I can t
 (11) Now does this show where the hatcheries are in Prince
 (12) William Sound?
 (13) A Yes it does
 (14) Q Can you tell us where the pink salmon hatcheries are in the
 (15) Sound here?
 (16) A Yes, I can Here is the Solomon Gulch hatchery up on top
 (17) right-hand corner Those are the cooler spawning
 (18) temperatures
 (19) and Solomon Gulch would be having fish coming back right
 (20) now
 (21) Then there s Cannery Creek also a pink salmon hatchery
 (22) Esther Noerenburg hatchery which is a pink salmon hatchery
 (23) Main Bay, I think it started out as a pink salmon hatchery back
 (24) in the earlier or mid 80s is no longer a pink salmon hatchery
 (25) it produces other species And then AFK down here is the
 fourth pink salmon hatchery in Prince William Sound
 (26) Q All right Now about what proportion more or less of the

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- (1) pink salmon fry that enter the Sound these days or that are
 (2) produced in the Sound come from hatcheries as opposed to the
 (3) wild stock?
 (4) A The - at least 54 percent of the production in Prince
 (5) William Sound this year this - these last few years have
 (6) come from hatcheries and that estimate might be up as high as
 (7) 80 percent depending on the year
 (8) Q And does that also depend upon which set of numbers you
 use
 (9) from ADF&G?
 (10) A Well that's one of the problems because of the spill
 (11) Alaska Fish & Game was able to give a lot more attention to the
 (12) area and they've actually found more streams They're minor
 (13) streams but nonetheless they still add them to the stream
 (14) count so that number's still evolving a bit
 (15) Q In any event is it at least about 50 55 percent or so?
 (16) A Yes over 50 percent
 (17) Q All right Now let me come back to -
 (18) MR COOPER Well Your Honor I would move to admit
 (19) exhibit 5120 DX5120
 (20) (Exhibit DX5120 offered)
 (21) MR JAMIN I think it was preadmitted but if it
 (22) isn't it's fine Your Honor
 (23) THE COURT If it hasn't been admitted already
 (24) Defendants DX5120 is admitted
 (25) (Exhibit DX5120 received)

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- (1) MR COOPER Thank you Your Honor
 (2) BY MR COOPER
 (3) Q Now with that little tutorial on life cycle and so forth
 (4) let's come back to the first approach you said you utilized in
 (5) tackling this question what effect the oil spill may have had
 (6) on the pink salmon in Prince William Sound I think if I
 (7) recall correctly you said that was basically looking at how
 (8) well these fish that were most potentially exposed did when
 (9) they came back?
 (10) A Yes
 (11) Q And can you tell us now which fish are you talking about?
 (12) A Well that's - that's the important distinction between
 (13) the two year classes because the two year classes were not in
 (14) any way experiencing oil in the same way You'd have the 1988
 (15) brood the even year class experience oil at the very end of
 (16) their incubation period so they experience it as new or
 (17) alevins ready to leave the gravel
 (18) Q That's this stage here?
 (19) A Yes they would be much more advanced than that which is
 (20) shown there that have very little yolk left on the abdomen and
 (21) then they would have experienced a potential exposure to oil in
 (22) that fry to fingerling stage when they would be rearing in
 (23) Prince William Sound
 (24) Q We're talking about wild stock?
 (25) A Wild stock

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- (1) Q And how about then the odd year brood?
 (2) A Well the odd year would have not experienced it as adults
 (3) of course because they would have come in after the oil had
 (4) left Prince William Sound for the most part But going into
 (5) those streams the stream captured some of the oil and it would
 (6) have deposited it in the gravel and the adults would have gone
 (7) in there deposited their eggs and that was the first year of
 (8) full incubation in stream gravels that had potentially oil
 (9) exposure
 (10) Q We've been talking about wild stock but as you just
 (11) mentioned there was also hatchery fish that were being
 (12) produced correct?
 (13) A Yes
 (14) Q And with respect to the hatchery fish, are there ever -
 (15) were there ever any hatchery eggs in streams?
 (16) A No of course not. They would have been in the hatchery
 (17) and would have been incubating under the hatchery's control
 (18) conditions with the controlled water supply and so forth
 (19) Q Where does that water supply come from?
 (20) A Well, I believe all of the hatcheries in Prince William
 (21) Sound have fresh water supplies that come from small little
 (22) lake basins, and that's one reason why the hatcheries can
 (23) produce fish a little bit earlier in development than wild
 (24) because they've got that warmer water and so those - those
 (25) hatchery fish would be protected in the hatchery under
 hatchery

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- (1) conditions
 (2) Q Now let's see I think you've located a videotape that
 (3) shows - sheds some light on the question of how these fish may
 (4) or may not have been exposed?
 (5) A Yes This was a promotional tape by the Prince William
 (6) Sound Aquaculture Corporation and so it shows their general
 (7) routine It's not any one particular hatchery but it's a
 (8) combination I believe of some of their hatcheries
 (9) Q Would it be helpful to explain how these hatchery fish are
 (10) protected from some aspect at least of the spill by referring
 (11) to that videotape?
 (12) A I think so
 (13) MR COOPER Your Honor with the Court's permission
 (14) I would show that videotape Exhibit DX0127 B
 (15) (Exhibit DX0127 B offered)
 (16) THE COURT Has that been admitted at this point?
 (17) MR COOPER I'm sorry?
 (18) THE COURT Has 0127-B been admitted at this point?
 (19) MR COOPER I don't believe it's been preadmitted
 (20) MR JAMIN If it's PX -
 (21) MR COOPER DX DX0127 B
 (22) MR JAMIN I haven't seen it May I have just a
 (23) second Your Honor? This is one that was not on the list
 (24) Your Honor based on counsel's representations we have no
 (25) objection

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- (1) THE COURT Defendants 0127 B is admitted You may
 (2) show it
 (3) (Exhibit DX0127 B received)
 (4) MR COOPER Why don't you go ahead and narrate this
 (5) Dr Brannon
 (6) THE WITNESS Is that showing on the screen here?
 (7) MR COOPER Should be on the monitor in a moment
 (8) (Videotape Played)
 (9) THE WITNESS This shows the adults coming back to the
 (10) hatchery and they home back at that hatchery in large numbers
 (11) of course and the purse seiners will scoop them up and kind of
 (12) encourage them into net pens You can see the net pens are
 (13) plastic frame pens with regular mesh webbing and the adults
 (14) are forced into those They're of course much more dense than
 (15) they could survive there for very long It's a very short term
 (16) exposure and actually siphon the fish into the hatchery where
 (17) they can make their selection for spawning Some of the
 (18) hatcheries allow the fish to swim in themselves and others will
 (19) use this device They come into the hatchery and they're
 (20) spawned and the eggs are put into these incubators in
 (21) darkness
 (22) because daylight or sunlight will kill the eggs and they're
 (23) very carefully handled at this stage and poured into the
 (24) incubator And in the spring of the year they'll hatch out or
 (25) emerge from those incubators and come down into these little
 collection tubes into a collection pond and from that pond

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- (1) they can pick them out and mark them They'll clip the adipose
 (2) fin that's the fin on the back by the tail and use that as a
 (3) mark to identify the hatchery fish They'll put them out in
 (4) the net pens and feed them until the plankton bloom is right in
 (5) Prince William Sound to release them Here's the young fish
 (6) being fed and waiting to be released in Prince William Sound
 (7) BY MR COOPER
 (8) Q Now those pens they tend to be right near the hatchery?
 (9) A Yes they are They're close - well I should say
 (10) they're - they have satellite facilities as well where they'll
 (11) haul the fish and release them if they want to spread the
 (12) return back into a larger geographical area for the fishery
 (13) purposes but the brood stock they're using will come back to
 (14) the hatchery
 (15) Q All right Now what did you look at to see to answer the
 (16) basic question as to how well these fish that were most
 (17) potentially exposed fared when they came back?
 (18) A Well that first route was to look at the total return back
 (19) into Prince William Sound - Primarily of those fish that were
 (20) at risk of exposure That would have been the progeny from the
 (21) 1988 brood and the progeny of the offspring of the 1989 brood
 (22) and they'd come back in 1990 as a two-year-old fish and 1991
 (23) as a two-year-old fish
 (24) Q What we're looking to do is to see how well these two
 (25) groups did?

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- (1) A That's right yes
 (2) Q Now you've prepared an exhibit that shows the return size
 (3) run size?
 (4) A Yes I have
 (5) Q Let me put DX5140-B up I think you have a light pen up
 (6) there Dr Brannon
 (7) A Yes I do
 (8) Q If you want to use that to explain Can you use this to
 (9) explain what this signifies to you?
 (10) A We have here the 1988 brood and the 1989 brood those are
 (11) the years the progeny or the years at risk when they were
 (12) either in the gravel or going out in Prince William Sound and
 (13) the 1988 produced the 1990 return and the 1989 produced the
 (14) 1991 return in Prince William Sound
 (15) Q And obviously those returns were pretty good?
 (16) A Yeah, that was the first test of course and in fact the
 (17) 1990 was the biggest run in the recorded history of Prince
 (18) William Sound and 1991 was the second largest run of pink
 (19) salmon in the recorded history of Prince William Sound
 (20) Q So the fish that were most potentially exposed were the
 (21) ones that came back first and second highest runs ever?
 (22) A Yes the 1988 of course had a very - a good return The
 (23) 1989 had a very good return They happened to have good
 (24) rearing conditions in Prince William Sound with a good
 (25) temperature good plankton level food supply and they came

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- (1) back very successfully
 (2) Q Now have you in fact ranked the various runs going back to
 (3) 1960 to show where these run sizes fit in if you go back that
 (4) far?
 (5) A Well I went back with regards to the wild runs because
 (6) the - the hatchery runs as you can see here dominated the -
 (7) that would be the yellow portion of the bar so it got - the
 (8) yellow portion of the bar here that would be the hatchery
 (9) component and the green portion of the bar would have been
 (10) the
 (11) wild component and the hatchery fish were very successful in
 (12) return The record hatchery return actually The wild fish
 (13) were not the record - record return but they were a very good
 (14) return
 (15) Q And is the listing, the ranking that you did of the wild
 (16) stock fish?
 (17) A Yes I just ranked the wild stock
 (18) Q Okay I think that's DX - can you read that? Well it
 (19) looks to me like 3681 - 8681 If I can put that on the
 (20) screen this is the ranking?
 (21) A Yes this would be the ranking of the 1988 brood
 (22) production so the fish that came from the 1988 brood actually
 (23) was the second best return success over the last 31 years of
 (24) the wild stock And the 1989 shown here was the fifth
 (25) largest return from the wild most productive return from the
 wild run in the last 31 years

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- (1) Q If we go back to that other chart DX5140-B for a moment
 (2) can you learn anything about the success of the wild stock run
 (3) wild stock portion of those two big years by comparing how
 (4) many returned versus how many - how large their parent return
 (5) was?
 (6) A Well you can look here the 1988 wild stock would have
 (7) contributed that much to the 88 brood Then they produce the
 (8) 1990 and so you can see the wild stock is at least twice as
 (9) good or better than their parent year so they had a very good
 (10) production and this would be in contrast say 1986 to 1988
 (11) where there was a substantial reduction from 1986 to 88 and
 (12) then in 1989 our line would be right there and - and they
 (13) produced up there in 1991 So their production was nearly
 (14) twice that of their parent year as well
 (15) Q What does that tell you then?
 (16) A Says the productivity the natural runs wild runs was very
 (17) good and was consistent with what we've seen in the hatchery
 (18) fish
 (19) Q Now we're going to come back to this later but obviously
 (20) if you look at 92 and 93 the runs were pretty low then?
 (21) A Yes they were
 (22) Q But those were not fish that were around in - at the time
 (23) of the spill March of 1989?
 (24) A No those are fish that were - were returning and not
 (25) exposed to any oil for at least two years

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- (1) Q So overall then from the returns that you observed and
 (2) the size of the returns of these fish what general conclusion
 (3) do you draw what does that tell you then about the impact of
 (4) the oil spill on pink salmon?
 (5) A Well I concluded based on the adult return information
 (6) that approach that the oil spill had really no effect on - on
 (7) the pink salmon populations
 (8) Q Now you've said that you used then a second approach to
 (9) look at this question?
 (10) A Yes
 (11) Q And that was - what was that approach?
 (12) A That was the percentage of fish that were potentially at
 (13) risk of exposure to oil
 (14) Q How did you go about looking at that time?
 (15) A Well I looked at the percentage of the run that was
 (16) produced by hatcheries and as we've gone through the
 (17) hatchery
 (18) routine the hatchery fish were not exposed directly to the
 (19) high concentrations of oil and so I eliminated them from the
 (20) percentage of the population in Prince William Sound that
 (21) would
 (22) be exposed Then I went to the wild population and I looked at
 (23) the percentage of the population in the natural environment
 (24) that would be exposed to oil and those that were not exposed in
 (25) the natural environment I added those to the hatchery fish and
 (26) those that were exposed in the natural environment I kept them
 (27) as a potentially exposed portion of the population

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- (1) Q All right Let's come back to that in a moment but let me
 (2) ask you first, did you look at the timing of the spill versus
 (3) the pink salmon run?
 (4) A Well as a basic approach looking at the issue of what
 (5) population or what segment of the population was exposed I
 (6) had
 (7) to know where the oil was where it went and that was looking
 (8) then at the pathway and timing of the oil
 (9) Q Now you have used things I think we've been calling it
 (10) the Gault model or the NOAA model for purposes of looking at
 (11) this timing?
 (12) A Yes NOAA tracked the oil in Prince William Sound They
 (13) actually did a simulation model which is a - is a best
 (14) demonstration of where the oil went based on overflights and
 (15) looking at the actual mapping of where the oil went, taking
 (16) into consideration the current patterns of water through Prince
 (17) William Sound and also wind patterns that would affect the
 (18) distribution of surface material, and Gault was a scientist for
 (19) NOAA Gault and others and they developed this simulation
 (20) model that would show the pathway and spread and the timing
 (21) of
 (22) the oil in Prince William Sound
 (23) Q Now you have made some modifications or additions to that
 (24) model?
 (25) A What I've done is add the timing components of when the
 (26) hatchery fish were released I've not superimposed that on the
 (27) model but it shows right after the basic model of when the fish

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- (1) were released
 (2) MR COOPER All right Your Honor I'd like to show
 (3) that video, if I may That is DX1820-A
 (4) (Exhibit DX1820 A offered)
 (5) MR JAMIN If it's not preadmitted it should be
 (6) there's no objection Your Honor
 (7) THE COURT Is it 18 -?
 (8) MR COOPER DX1820-A Your Honor
 (9) THE COURT Is admitted
 (10) (Exhibit DX1820-A received)
 (11) MR COOPER Your Honor while I'm on that I should
 (12) move to admit if I haven't already 8681 if I have that
 (13) number right the ranking of the -
 (14) (Exhibit 8681 offered)
 (15) THE COURT Is there objection to 8681
 (16) MR JAMIN There is not Your Honor
 (17) THE COURT Defendants Exhibit 8681 is admitted
 (18) (Exhibit 8681 received)
 (19) THE COURT There was another one you talked about
 (20) 5140-B If it's not we -
 (21) (Exhibit 5140 B offered)
 (22) MR JAMIN If not -
 (23) THE COURT Defendants' Exhibit 5140 B is admitted
 (24) (Exhibit 5140 B received)
 (25) MR COOPER Thank you

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- (1) BY MR COOPER
 (2) Q Will you narrate the videotape for us then?
 (3) A Yes I will
 (4) (Videotape Played)
 (5) THE WITNESS Okay this is the oil spill simulation
 (6) modeled and the pink salmon fry released timing And the oil
 (7) spill you can see there coming out from Bligh Reef and it
 (8) drifted by wind and current in the southwesterly direction It
 (9) went down through the - the corridor there around Knight
 (10) Island
 (11) BY MR COOPER
 (12) Q Timing we're at March 29?
 (13) A Yes
 (14) Q March 30 now?
 (15) A So we re looking at March 31 the beginning of April 1st
 (16) and oil is passing through into the Gulf area those specs that
 (17) you can see there occurring southwest of the - of the Prince
 (18) William Sound area shows the oil going out and the date here
 (19) now is April 6th already We still have no major emergence
 (20) coming from the wild streams and nothing released from the
 (21) hatcheries and the oil is passing through with the exception
 (22) of that oil that is reaching on the beach or is being slowed
 (23) down in the base or what we re seeing a regular pattern of
 (24) movement where quite a bit of the oil is moving out of Prince
 (25) William Sound clear up through April 14th April 15th nearly

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- (1) three weeks now past the time of the oil spill And so the oil
 (2) is continuously moving through with the current that goes in a
 (3) kind of a counterclockwise direction from outside into Prince
 (4) William Sound and down through the southwest corner
 (5) Q And then at what time then, do the fish start coming out
 (6) of the streams?
 (7) A Well now we start - well about the middle part of April
 (8) is a general kind of a point of reference and here s the
 (9) timing of the hatcheries You can see Esther hatchery April
 (10) 23rd to May 24th AFK, 24 April to 3 May Solomon Gulch 25
 (11) April to 19 May and 5 May to June 1st of Cannery nearly a
 (12) month plus after the potential of the oil spill
 (13) Q Now you re not saying that there wasn't any oil still
 (14) around in Prince William Sound?
 (15) A No I m not I m saying that the body of oil was being
 (16) drained out of Prince William Sound over this period of time
 (17) still oil on the beaches certainly
 (18) Q And you still -
 (19) A Still oil in the gravel
 (20) Q You ve still got the problem of oiled streams and so forth?
 (21) A That s right.
 (22) Q But better I guess that that release came a month or so
 (23) after the spill than right at the time of the spill?
 (24) A Well that was fortunate from the standpoint of several
 (25) reasons I guess

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- (1) Q Now you mentioned before that you undertook to calculate
 (2) then as I understood it the portion of the fry that were
 (3) being released into the Sound either by the hatcheries or wild
 (4) stock from the streams that might have been exposed or were
 (5) more likely to have been exposed to any of this oil?
 (6) A Yes I did
 (7) Q How did you go about doing that? Just briefly?
 (8) A Well the hatchery fish are known I mean the released
 (9) numbers not every individual fish certainly but the general
 (10) population size coming out of the hatchery is a known number
 (11) And I'd take those as the hatchery contribution from the four
 (12) pink salmon hatcheries in Prince William Sound and then the
 (13) wild population as you can see the pathway of the oil excluded
 (14) a lot of Prince William Sound from oil concentrations in the
 (15) water column to an extent and so I took that area that was
 (16) around the - the eastern northern and western perimeter where
 (17) the oil didn't go and used that as the portion of the
 (18) population in Prince William Sound that was not impacted by oil
 (19) of the wild fish And then I took the corridor where we
 (20) noticed the oil came down along Knight Island Montague
 (21) Island
 (22) and some of the other islands there and looked at that as the
 (23) oil corridor but of course not all those streams in that
 (24) corridor were even oiled
 (25) For that objective I used the stream cleanup assessment
 team s assessment of what shoreline and therefore streams
 were

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- (1) oiled and that was a team of scientists from NOAA Alaska Fish
 (2) & Game included Exxon the Coast Guard that was the official
 (3) designation of what was oiled and what wasn't oiled to the best
 (4) of their judgment
 (5) MR COOPER All right Now incidentally Your
 (6) Honor before I - if I didn't move to admit the videotape
 (7) 1820-A I would do so now
 (8) THE COURT You did
 (9) BY MR COOPER
 (10) Q You have prepared an exhibit Dr Brannon to show what
 (11) you
 (12) ended up with in this calculation you were just describing?
 (13) A Yes it lays out the distribution of the different segments
 (14) of the run
 (15) Q I think that s Exhibit 8898-A Let me see if I understand
 (16) this Where would you start out here one of the hatcheries?
 (17) A My light pen isn't working here so I'll just -
 (18) Q Try getting the color on
 (19) A Okay, there we go So if we look at the hatchery
 (20) contributions this would be the 1989 hatchery contributions
 (21) we've got the AFK hatchery and they produce 161 million fry
 (22) 17 percent of the entire population in Prince William Sound
 (23) Esther hatchery, 160 million another 17 percent of the
 (24) population of fry in Prince William Sound
 (25) Q These were all fry that were protected at least in part
 from the spill by virtue of the way the hatcheries operated as

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- (1) we saw?
- (2) A Both by where the hatchery was located being out of the
- (3) pathway of the oil except for AFK and the fact that their
- (4) rearing area was protected away from oil Cannery Creek up
- (5) here six percent another 59 million Solomon Gulch 129
- (6) million 14 percent And those hatcheries then constitute
- (7) about 54 percent of the entire population in Prince William
- (8) Sound
- (9) Then we have the non spill affected areas and that would
- (10) have been the areas around Prince William Sound that were not
- (11) in the pathway or the corridor of oil
- (12) Q You calculated how many - how many fry were released into
- (13) the Sound and from those areas?
- (14) A Yes that calculation was simply a direct estimate The
- (15) estimate that Alaska Fish & Game uses to come up with the
- (16) production of fry from a given number of adults so it would be
- (17) the number of fry recruited from the adult spawning population
- (18) and then I took the number of oiled streams against the number
- (19) of unoiled streams in those areas and estimated the number of
- (20) wild fish actually produced from those streams
- (21) Q And that turned out to be?
- (22) A 344 million in the area of non impact and in the area of
- (23) impact there was about 87 to 90 million fry, which constitutes
- (24) about nine percent of the Prince William Sound population But
- (25) I want to point out that the oiled streams in that impact -

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- (1) Q Before you do that let me just - so the nine percent that
- (2) you come up with is the basically the percentage of the - of
- (3) the total fry that were entering the system from hatcheries or
- (4) otherwise that was either not protected because it was inside a
- (5) hatchery for at least part of this time or from an area that
- (6) wasn't in the trajectory of the spill?
- (7) A Right That would be this along this corridor where the
- (8) oil had the biggest distribution on the beaches and whatnot.
- (9) That would have been the area that contained the 87 million
- (10) fry or 90 million fry
- (11) Q Are there some further adjustments that you would make to
- (12) that number in order to get down to the fish that were really
- (13) the most potentially exposed?
- (14) A Yes I would The actual number of oiled streams in that
- (15) corridor area was a substantially smaller number than the total
- (16) streams in it
- (17) Q Do you know exactly what the number is?
- (18) A Well because we haven't defined the exact number of
- (19) streams in Prince William Sound I can't give you a stream
- (20) number but in terms of the 1985 anadromous stream catalogue
- (21) and taking that percentage and applying it to whatever number
- (22) of streams there might be in Prince William Sound it comes out
- (23) to about one percent of the streams in Prince William Sound
- (24) were actually oiled but in that corridor of streams that were
- (25) oiled it's a good 10 percent of the streams in that area

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- (1) MR COOPER Your Honor I would move to admit this
- (2) Exhibit 8898-A
- (3) (Exhibit 8898 A offered)
- (4) MR JAMIN No objection
- (5) THE COURT It is admitted without objection
- (6) (Exhibit 8898-A received)
- (7) BY MR COOPER
- (8) Q So Dr Brannon then let me pick up just a couple more
- (9) things before we leave this point on the hatchery fish In
- (10) looking at the potential for exposure to the hatchery fish did
- (11) you look at their survival rates?
- (12) A Yes I did
- (13) Q And can you explain why you - what you were looking at and
- (14) why?
- (15) A Well I was looking at the - you might say the return per
- (16) spawner That's not a totally valid number because the
- (17) hatcheries harvest their total return or much of their total
- (18) return and keep the brood stock from that and so if you look
- (19) at just the number of fry released from the hatchery and the
- (20) success of fish coming back that gives you a good estimate of
- (21) the percent survival of hatchery fish and I have an exhibit
- (22) showing the general survival success of the hatchery fish
- (23) Q And if I read this correctly I believe that's DX5139 A
- (24) Is that the exhibit?
- (25) A Yes that's the exhibit

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- (1) Q And can you explain that?
- (2) A Well you can see that the - again the 1990 and the 1991
- (3) years of return were the fish of greatest risk because the 1988
- (4) and 89 brood were the ones exposed to oil so then I looked at
- (5) the survival success and if there was a potential for exposure
- (6) and poor survival you'd expect to see it in the percent of
- (7) hatchery survival
- (8) Q How do they determine what the survival is for these
- (9) hatchery fish?
- (10) A The number of fry released and the adult count coming back
- (11) both in the fishery and the hatchery and the adult returns
- (12) would be based on hatchery marks Not all the hatchery fish
- (13) would be marked but a percentage of hatchery fish are marked
- (14) Q So it happens with a hatchery because both those numbers
- (15) are known unlike in the case of the wild stock you have a
- (16) ready means of calculating their survival rate?
- (17) A Yes, those numbers are good estimates
- (18) Q All right, I think I interrupted you in the middle of your
- (19) answer
- (20) A So then we have the 1990 return which was higher than any
- (21) other return in recent years and the 1991 return which was as
- (22) good as the second largest prior to that time indicating we
- (23) had very good hatchery survival Six percent five percent
- (24) would be exceptional exceptionally high survival for hatchery
- (25) fish

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- (1) Q Before we leave the hatcheries altogether let me just ask
 (2) you quickly with respect to the one hatchery that you said was
 (3) in the trajectory of the spill that was AFK?
 (4) A Yes
 (5) Q Was it your understanding that special measures were taken
 (6) to try to protect the waters near that hatchery?
 (7) A Yes I saw a video put out by the PWSAC corporation about
 (8) the extent of effort they put in to keep the oil away from the
 (9) hatchery They were about ready to release their fry or at
 (10) least they were putting them in the pens to rear them and they
 (11) were concerned about the oil coming down and causing
 (12) problems
 (13) and so they put out an extensive amount of - of oil boom to
 (14) prevent the oil from getting into the hatchery area
 (15) Q A lot of fishermen worked awful hard in order to keep the
 (16) oil out of there?
 (17) A That's right
 (18) Q Now we've talked about the percentage OF the fish that
 (19) were most likely or most potentially exposed Is another
 (20) potential way that these fish could have been exposed even if
 (21) they were from a - a stream on the eastern side of the Sound
 (22) where the oil never reached or from a hatchery as they swam
 (23) through the water column? I mean is that something that one
 (24) should consider?
 (25) A Well that was certainly an area of concern to us in
 Prince - in Puget Sound about the - the delay effect it might

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- (1) have of fish moving through it In Prince William Sound that
 (2) of course was a concern It primarily dealt with the 1988
 (3) brood offspring
 (4) Q Now that is referring back to this chart - well we can
 (5) just hold it up You're referring to the - these fish?
 (6) A Just really those fish in the marine environment If you
 (7) put the red arrow right by that particular fish there yeah
 (8) that would be the stage of greatest concern for that brood
 (9) year and that was the only brood year that had potential risk
 (10) for exposure to elevated oil concentrations in the water
 (11) column Now I mean substantially elevated because of the oil
 (12) coming off the beach of course would always have some level
 (13) of contribution to the water column even though it might be
 (14) very very small
 (15) Q I'm sorry, I didn't mean to interrupt your answer
 (16) A But that would be the year of primary risk.
 (17) Q And the odd year brood with respect to that brood by the
 (18) time you get fish in the water column there you're already
 (19) into 1990?
 (20) A That's right. Those fish would have come out into Prince
 (21) William Sound virtually with no oil in the marine environment.
 (22) Their potential risk was during the incubation period
 (23) Q Now you were here I think when Dr. Neff was testifying
 (24) earlier?
 (25) A Yes I was

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- (1) Q And you probably heard much of his testimony about the low
 (2) water column measurements of VOAs and PAHs according to
 (3) the
 (4) measurements that he took?
 (5) A That's correct
 (6) Q And you heard his testimony about the water toxic -
 (7) toxicology tests that were conducted on mysid shrimp and
 (8) sheepshead minnows and so forth?
 (9) A I'm aware of that yes
 (10) Q I don't want to have you repeat what he has already said
 (11) but what just generally what conclusion do you reach about
 (12) the likelihood of exposure of these fish that we've been
 (13) talking about to oiled or to oil as they were swimming through
 (14) the water column?
 (15) A Well there just wasn't enough oil in Prince William Sound
 (16) in the water column to do any harm to the pink salmon That's
 (17) the general conclusion The concentrations that are toxic are
 (18) several hundred times higher than what was measured in Prince
 (19) William Sound and even my own work at University of
 (20) Washington
 (21) looking at oil where we did bioassay work the concentration
 (22) is many times hundred times less or was a hundred times less
 (23) in Prince William Sound than what would concern me about
 (24) toxic
 (25) effects So there just was not enough oil there in the water
 column to effect the pink salmon
 (26) Q All right. Have we now covered basically the points that
 (27) you wanted to make with respect to the second basic area that

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- (1) you were looking at the potential for exposure?
 (2) A I think so yes
 (3) Q All right You indicated at the beginning that there were
 (4) three principal things that you were looking at How the fish
 (5) that were most exposed did when they came back we've talked
 (6) about that
 (7) A Yes
 (8) Q How many fish were really exposed we've talked about that
 (9) and the third group then was what?
 (10) A Third group was the bank of studies that I recommended to
 (11) Exxon that we undertake to look at effects of oil on critical
 (12) life history stages
 (13) Q Can you explain generally what you went about doing there?
 (14) A Yes And you want me to review that did you say?
 (15) Q Yes and while you're doing that I'm going to see if I can
 (16) get the Rock of Gibraltar out from under my contact lens here
 (17) Go ahead
 (18) A Well if we can take the acetate on the life cycle poster
 (19) and put it down over, it'll help everyone see You might have
 (20) to move that arrow off there
 (21) So that shows the general life history stages that we
 (22) looked at and I - I felt that the - the critical areas dealt
 (23) with each one of those life history stages that I've got marked
 (24) on the poster
 (25) Q Shall we start with the earliest stages the embryos?

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(1) A Yes that would be 1989 the embryo survival study and here
 (2) this would have been done then on those fish that were
 (3) experienced The incubation environment the first group of
 (4) fish that experienced their incubation environment for the
 (5) whole of their incubation period and to do this we went to
 (6) oiled streams and spawned fish and put their eggs in little
 (7) baskets and put them in the gravel and we went to the
 (8) non oiled streams and spawned fish and put their eggs in little
 (9) baskets and I've simplified it It was quite a controlled
 (10) complex system We wanted to make sure we had the various
 (11) tidal levels covered the low tide the middle tidal area and
 (12) the upper tidal area in that intertidal area and then we
 (13) wanted to look at the intertidal areas well enough so we would
 (14) put several boxes in each one of those intertidal areas We d
 (15) have about 12 boxes per intertidal area about - pardon me
 (16) six six per intertidal area and 18 per stream - 24 per
 (17) stream sorry
 (18) Q The idea you were looking for - what were you looking for?
 (19) A We were looking to see if oil would have any impact on the
 (20) survivability of the alevins incubating in that oiled substrate
 (21) or oiled gravel and we compared then oiled streams versus
 (22) unoiled streams and looked at survival just after hatching
 (23) Went back to those streams I didn't it was Dr Moulten, one
 (24) of my field personnel and he went back He is the one that
 (25) designed that study actually and went back and removed those

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(1) boxes and looked at the live/dead ratio
 (2) Q You've got an exhibit I think that shows some of the
 (3) results from this?
 (4) A Yes the results are summarized on the next exhibit.
 (5) Q That would be Exhibit DX5106
 (6) A Okay now this shows the actual results from the embryo
 (7) study and at the four tidal levels this would be about at the
 (8) two foot tide level - pardon me the six foot tide level the
 (9) eight foot ten foot and 12 foot We report things in meters
 (10) because that's what's required for publications and in the
 (11) scientific literature and - but it comes down to the six
 (12) eight ten 12 foot level Kind of a midsection of the tide
 (13) level and - the squares the blue squares are the unoiled
 (14) streams and the red diamonds are the oiled streams and here
 (15) you can see that the difference between the unoiled streams
 and
 (16) the oiled streams was very very very close It was not
 (17) significantly different As you can see in this comparison
 (18) between the controlled or the unoiled stream and the
 (19) experimental or the oiled stream
 (20) Q What basic conclusion then do you draw from that?
 (21) A Well I concluded from this study that there was no impact
 (22) on the embryo stage of the development in the gravel and this
 (23) was important because it was the first incubation period in
 (24) which the oil was exposed to the alevins throughout the
 (25) incubation period and so it was an important study And if we

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(1) were going to find affects on the eggs we should have seen it
 (2) here and we demonstrated to our delight that there wasn't
 (3) any
 (4) MR COOPER Your Honor I think it's now Mount Denali
 (5) that has moved into this contact lens I wonder if I might
 (6) take a moment I could just take it out probably operate on
 (7) one eye
 (8) MR JAMIN Please
 (9) THE COURT We've already fixed one technical problem
 (10) this morning we'll take care of another
 (11) MR COOPER This is our morning for technical
 (12) problems
 (13) That certainly feels a lot better I may not see very
 (14) well
 (15) BY MR COOPER
 (16) Q Now, we've talked about - maybe I can move this over here
 (17) in such a way, I don't know whether that's visible or not If
 (18) that's visible we could just leave it there We have talked
 (19) about the embryo survival study What was the next one that
 (20) you did and why?
 (21) A Well I'll have to go from memory because I can't see the
 (22) board anymore but that -
 (23) Q I've got you at a definite disadvantage If I give you a
 (24) hint maybe the thing to do would be to go on to the alevin
 (25) studies?

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(1) A I think if you just brought up that easel and put it on the
 (2) floor next to the easel I could see it there
 (3) Q You can but I'm not sure the jury can Now can you see
 (4) it Dr Brannon?
 (5) A I can see it very well thank you
 (6) MR COOPER Your Honor?
 (7) THE COURT Don't worry about me
 (8) BY MR COOPER
 (9) Q All right. Alevin studies?
 (10) A Okay, the next - the next set was our alevin studies and
 (11) the alevin studies involved again going to oiled streams and
 (12) going to unoiled streams and sampling just before emergence
 to
 (13) look at the survival or the live/dead ratio of the alevin and
 (14) whatever eggs, and at that stage the eggs would have been
 dead
 (15) if they were still eggs So we'd look at the live/dead ratio
 (16) out of those streams and we'd remove them by going in with a
 (17) pump and pumping in water into a section of stream that we had
 (18) quartered off with a little live trap and the water would
 (19) upwell in that live trap and catch the alevins coming out of
 (20) the gravel as well as any dead material so it was just like
 (21) washing them out with a hose you might say And then we'd
 (22) look at the - the live percentage and we'd look at the dead
 (23) and then we'd look at them for anomalies if there was any
 (24) deformities that we could associate with the oiled stream
 (25) compared to the lack of them in the unoiled stream

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- (1) Q Now you've prepared an exhibit that gives you an example
 (2) or provides an example of what you're saying?
 (3) A Yes I have
 (4) MR COOPER Before we go to that I would ask if I
 (5) didn't to move DX5106 --
 (6) (Exhibit DX5106 offered)
 (7) MR JAMIN No objection
 (8) THE COURT You've got two I got a question about
 (9) DX5106 submitted no objection
 (10) There was a previous one DX5139-A is that all right also?
 (11) (Exhibit DX5139-A offered)
 (12) MR JAMIN Fine
 (13) THE COURT Defendants Exhibit 5139-A is also
 (14) admitted
 (15) (Exhibit 5139-A received)
 (16) BY MR COOPER
 (17) Q I'll put up Exhibit DX5103 Is that the one that shows
 (18) summarizes your findings?
 (19) A Yes that summarized it for both the 1989 and the 1990
 (20) periods
 (21) Q You did that twice?
 (22) A Yes we did it in the '89 for the '90 brood or '90
 (23) emergence and we did it in '90 for '91
 (24) Q That's this one?
 (25) A Yes So the alevin studies there are shown in 1991 on the

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- (1) A Yes
 (2) Q And in 1991?
 (3) A Now 1991 was another important year It was a very
 (4) different kind of study as you can see on the chart of the
 (5) pink salmon life cycle the 1991 alevins came from the 1990
 (6) adults and the 1990 adults would have been exposed to oil
 (7) potentially exposed to oil at least as fingerlings in the
 (8) marine environment So now we're looking at the progeny of
 (9) the
 (10) fish that were exposed to oil and here again we found that
 (11) their survivals were no different Now I don't put any
 (12) significance between the difference in survival between '90 and
 (13) '91 That's kind of the normal variation you'll have from
 (14) year to year, but it definitely shows between the reference or
 (15) the unoled streams and the oiled streams there was no
 (16) difference
 (17) MR COOPER Your Honor I would move to admit DX5103
 (18) (Exhibit DX5103 offered)
 (19) MR JAMIN No objection
 (20) THE COURT It is admitted
 (21) (Exhibit DX5103 received)
 (22) BY MR COOPER
 (23) Q Now did you also - what's the next study that you did?
 (24) A Well the next study of course looked at the percentage
 (25) of abnormal fish in the oiled versus the unoled streams and so
 of those fish that we were taking out with that pump we'd take

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- (1) poster and they're shown in 1990 on the lower section there
 (2) with the red arrow
 (3) Q Now this graph that we have up here on the screen you're
 (4) charting the percentage of live alevins on the left vertical
 (5) axis there?
 (6) A Yes that would be the percent live There'd be no life
 (7) eggs left at that time so they would be taken into
 (8) consideration from the standpoint that they would represent
 (9) some of the dead material that would have been in the - in the
 (10) gravel
 (11) Q What did you find in 1990?
 (12) A Well 1990 we found that there was really no difference
 (13) between the oiled streams and the reference streams and this
 (14) was - this was the year that had been exposed to the oil if
 (15) oil was in the stream they'd been exposed to it through the
 (16) entire incubation period and these alevins showed no
 (17) difference
 (18) in survival between the oiled and the unoled streams
 (19) Q So if I can get some color that would be the area there
 (20) that I just circled?
 (21) A Yes So that would have been -
 (22) Q Both the oiled - oiled in the reference - does reference
 (23) mean unoled?
 (24) A That's correct
 (25) Q The oiled and the reference streams then were both
 basically at about the same percentage of live alevins?

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- (1) about 140 per tidal level and preserve those and send them
 (2) back
 (3) to the laboratory for closer evaluation to see if they were
 (4) containing any abnormal individuals
 (5) Q And is that your emergent fry work?
 (6) A No This was simply the - the abnormal percentage of the
 (7) alevins and that turned out that those were again no
 (8) different between the oiled and the unoled streams You don't
 (9) expect to have a high degree of abnormal fish in natural
 (10) situations and that was true in both the oiled and unoled
 (11) streams It was another check on the potential effect of oil
 (12) Q Now, did you also at some point then in some of these
 (13) studies look at the condition of the fry?
 (14) A Well I looked at fry condition in the fry emergent
 (15) studies
 (16) Q And that was?
 (17) A That would be that, still in the alevin studies arrow it's
 (18) in that section of their life history The fry now have
 (19) absorbed their yolk and they're getting ready to come out of
 (20) the gravel We looked at fry emergence timing because here
 (21) we
 (22) could look at a very subtle influence didn't involve
 (23) mortality not direct mortality it didn't involve any kind of
 (24) abnormality in physical characteristics but it might include
 (25) an abnormality in their behavior
 Now if they come out for instance too early they'll
 still have a little bit of yolk sac left on them and they'll be

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- (1) very vulnerable to predation That yolk is red fish can see
 (2) it and if you ve ever been around a hatchery you can see how
 (3) readily they start feeding on things that are red induces that
 (4) feeding response and if they came out with a little bit of
 (5) yolk showing they would be very vulnerable to being eaten but
 (6) not only that with that little amount of yolk it would create
 (7) a resistance and they couldn t swim quite as well so it s a
 (8) double edged sword - I shouldn t say double-edged sword it s
 (9) a double jeopardy for them
 (10) Q What did you find out when you looked at this?
 (11) A What we found out was that those alevins that came out of
 (12) the oiled streams had the same condition factor the weight
 (13) length relationship as those from the unoled streams
 (14) Q All right and then did you look at - what other studies
 (15) did you do now that you haven t told us about?
 (16) A Well I haven t talked about the early manne stage in
 (17) 1990 We went out and sampled in the manne environment
 (18) We
 (19) went to the oiled bays and selected four oiled bays and we
 (20) went away from the oiled areas and selected four unoled bays
 (21) and we went in with a larger vessel and a seine skiff and used
 (22) a mid water troll to sample the fingerlings from the marine
 (23) environment
 (24) Q And what were you looking for what kind of things were
 (25) you -
 (26) A We were looking to see if there was any growth effects

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- (1) negative growth effects We looked at general size but we
 (2) also really were more concerned about their condition factor
 (3) again their weight/length relationship that would indicate
 (4) whether they were a little bit on the starving side or whether
 (5) they were really doing well
 (6) Q And what did you find out?
 (7) A We found that the fish in the marine environment actually
 (8) showed the same kind of performance They were of high
 (9) condition good condition and there was no difference between
 (10) the oiled bays and the bays It more or less confirmed the
 (11) fact that there was no effect of oil There really wasn t much
 (12) opportunity for oil in the spring of 1990 in the - in the
 (13) marine environment but it showed that those fish had no
 (14) lingering effect at least of the oil
 (15) Q Now you also did some studies that we ve got them listed
 (16) here as adult returns Can you explain what - I see there s
 (17) two of them one for each?
 (18) A Yes we looked at the adult returns in 1989 1990 1991
 (19) and 1992 so we looked at adult returns for two successive
 (20) generations
 (21) Q And here you were doing more than just counting the
 (22) number
 (23) of adults that returned?
 (24) A That s right because the streams that were oiled were
 (25) really smaller the total number of fish going to those streams
 (26) would normally naturally be fewer in number and so we looked
 (27) at

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- (1) the actual spawning area in those streams and looked at the
 (2) number of adults spawning per unit of spawning area
 (3) Q And if you had seen a significant difference what would
 (4) that have meant to you?
 (5) A Well that would have meant that the adults came back and
 (6) either avoided those streams or that when it came - as they
 (7) were produced as young they might have had a higher mortality
 (8) and just simply couldn t come back
 (9) Q What did you find then, when you looked at those?
 (10) A We actually found that the oiled streams in spawner density
 (11) was no different than the unoled streams
 (12) Q All of those years where you looked at it?
 (13) A There was variation between year to year and I can t
 (14) recall the magnitude of the variation but they were virtually
 (15) insignificantly different.
 (16) Q Now I think we ve talked about all of them except one the
 (17) alevin studies - I m sorry the egg viability study?
 (18) A Egg viability
 (19) Q Can you tell us what you did? You did two of those?
 (20) A Yes I did I did it in 1990 and I did it again in 1991
 (21) The egg viability studies were meant to look at the long term
 (22) or potentially genetic effects of oil on the survival of pink
 (23) salmon in Prince William Sound And understanding that the
 (24) actual number of fish in the oiled area was low but this was
 (25) looking just at the viability of those in the oiled area versus

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- (1) those in the unoled streams in that area
 (2) Q You were looking at the viability basically, how well the
 (3) eggs did from the fish the eggs that were produced from the
 (4) fish that were most potentially exposed to the oil?
 (5) A That s right This was what I felt was one of the critical
 (6) studies The 1988 brood that came back of course in 88 and
 (7) spawned their progeny experienced the oil in the spring of
 (8) 1989 And had there been some difficulty in development rate
 (9) or tissue elaboration development growth that could have
 (10) been passed on into their - their small little gamuts the
 (11) ones that are going to produce eggs in the fish
 (12) So when it came back as adults, the best way to look at
 (13) that potential genetic effect was to be the eggs of those fish
 (14) that came back from exposure to oil and to see if they have a
 (15) high degree of viability viability means that their survival
 (16) success would be high They re capable of being fertilized and
 (17) they grow into little fish
 (18) Q I think we ve got an exhibit that shows some of your
 (19) results from there DX5099 This demonstrates the results of
 (20) your 90 and 91 agency viability study?
 (21) A Yes it does And in 1989 the fish that were exposed
 (22) potentially in the marine environment came back and spawned
 (23) and
 (24) their eggs that I took from those fish in 1990 and took back to
 (25) a hatchery for incubation demonstrated that the success of
 (26) survival was the same in both those streams that produced fish

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- (1) from oiled substrate compared to those from the unoiled
 (2) substrate
 (3) Q So for instance in 19 -- in 1990 whether it was the
 (4) unoiled stream or the oiled stream they -- the egg viability
 (5) was essentially the same percentage?
 (6) A Yes it was Now these streams would have produced fish
 (7) that came down into oiled bays It was primarily the marine
 (8) environment we re concerned about here and even though the
 (9) streams were oiled and unoiled it was primarily the bay that
 (10) we were looking at in 1990 and there was no difference
 between
 (11) fish that had to rear initially in the oiled bays versus those
 (12) from the unoiled bays
 (13) Q And in 1991 again essentially the same?
 (14) A Well in 1991 now we re looking at the same kind of a
 (15) situation The fish had been exposed to oil in this case
 (16) during the incubation environment when they came back as
 (17) adults we looked at their offspring viability and -- and did
 (18) the same thing with those fish except now they represented the
 (19) incubation environment, rather than marine environment and
 (20) they showed no difference in egg viability
 (21) Q Now let me show you one other exhibit -- let s see I
 (22) think we covered all of the studies that you did?
 (23) A Yes that completes I think all of the studies that
 (24) was -- that were done
 (25) THE COURT Did you want that --

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- (1) MR COOPER Let me stop there for a moment
 (2) BY MR COOPER
 (3) Q As a result of these various scientific studies that you
 (4) did did you reach a conclusion as to the likelihood or lack of
 (5) a likelihood that the oil spill had any impact on the
 (6) population level any significant impact on pink salmon?
 (7) A I had to make that decision on -- in this bank of studies
 (8) simply based on my research and in all the research that I did
 (9) and the early life history stages right up through to the adult
 (10) and the viability of the eggs that those produce that those
 (11) adults produce I detected no measurable effect of oil
 (12) Q Now there was testimony earlier by Dr Page, which I don t
 (13) think you were here for but he testified concerning the
 (14) presence of fish in naturally oiled streams I want to just
 (15) put one exhibit up that wasn t shown with Dr Page and ask you
 (16) a question about that First, though, Your Honor I would move
 (17) to admit exhibit if I can read it 5090 I think it is
 (18) (Exhibit DX5099 offered)
 (19) MR JAMIN I think it s 5099 and it s fine
 (20) THE COURT My notes suggest it s 5099
 (21) MR COOPER It s difficult to read on here So it is
 (22) 5099
 (23) THE COURT Defendants Exhibit 5099 is admitted
 (24) without objection
 (25) (Exhibit DX5099 received)

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- (1) MR COOPER Do you have DX8658 A?
 (2) BY MR COOPER
 (3) Q Now you ve seen this before? Can you --
 (4) A Yes I have
 (5) Q Can you explain what this indicates?
 (6) A This is a list of about 25 streams in Alaska and it s not
 (7) the only streams that are oiled but 25 streams that are listed
 (8) here and I think Mr Page did the examination of the records
 (9) to show what streams actually were oiled and whatnot
 (10) Q You haven t gone out and checked?
 (11) A I haven t done anything on this No I m just referring to
 (12) it And you have the five species of salmonids across the top
 (13) there the sockeye coho pink chum and the dolly varden and
 (14) it shows that of those species are in oiled streams and in
 (15) fact even shows what streams with the dark shadows on those
 (16) boxes across the side there what streams are routinely used to
 (17) enumerate salmon in
 (18) Q That s by ADF&G?
 (19) A By Alaska Fish & Game yes
 (20) Q They have certain streams they use as index streams?
 (21) A These are not probably totally categorized as oiled
 (22) streams I think down there Oil Creek in the bottom of the
 (23) chart oddly enough called Oil Creek is a pink salmon index
 (24) stream where they use that to determine what the return will be
 (25) in the next brood year

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- (1) Q Let s see, we ve got -- these as you understand it are
 (2) all streams Dr Page found were naturally oiled but supported a
 (3) salmon run of one kind of another?
 (4) A That s right, yes
 (5) Q And of those streams there are what one two three
 (6) four five six seven eight nine that were where apparently
 (7) he found -- where there are records of pink salmon?
 (8) A In some cases pink salmon might be in other streams but no
 (9) one s looked These are simply from the records
 (10) Q What significance, if any does this fact have with the
 (11) fact that there are salmon that apparently naturally live in
 (12) the environment of these oiled streams in reaching your
 (13) conclusion about the effect of the -- the impact of the oil on
 (14) pink salmon?
 (15) A I think it s a matter of -- of concentration If you had
 (16) really a high concentration of oil as we ve demonstrated in
 (17) bioassays you can certainly kill fish kill pink salmon but
 (18) even in situations where there s low concentrations salmon can
 (19) do quite well and this is evidence that they do quite well in
 (20) these situations
 (21) Q Now you ve now told us about the three different
 (22) methodologies or three basic approaches that you took the
 (23) scientific studies the potential exposure, how many were
 (24) potentially exposed and how the fish did when they came back
 (25) that were most likely to have been impacted by the oil?

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- (1) A Yes
- (2) Q What I d like to do now is to move to a slightly different
- (3) subject There was testimony earlier I believe from Dr
- (4) Mundy about some studies or a study that was done by the
- (5) trustee counsel some of the trustee counsel scientists that
- (6) had to do with embryo mortality Do you know what I m
- (7) referring to there?
- (8) A Yes I am
- (9) Q I think they have been referred to as the Bue study?
- (10) A Yes the Bue study
- (11) Q You have looked at the work that Mr Bue did in this area
- (12) of whether there was increased embryo mortality in streams that
- (13) were oiled in 1989?
- (14) A Yes I have
- (15) Q Do you agree with his conclusions?
- (16) A Well I - I disagree with the - the portion of it that
- (17) deals with the eggs the egg mortalities I don t disagree
- (18) with it with respect to what he found with the alevin
- (19) mortalities
- (20) Q Is that the difference between fall and spring that we re
- (21) talking about?
- (22) A Yes the egg mortalities would have been assessed for in
- (23) the spring - pardon me in the fall of the year just shortly
- (24) after spawning The alevin survival or mortalities would be
- (25) assessed in the fall - in the spring of the year just before

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- (1) emergence
- (2) Q All right Now I think this is an area where it might help
- (3) to do a run through an example that you and I have talked
- (4) about Do we have a flip chart?
- (5) All right if my memory is correct we start with a couple
- (6) of streams?
- (7) A Yes and the reason we re doing that is because the - my
- (8) disagreement with the conclusions that there s higher egg
- (9) mortality in the streams and yet there s no difference in the
- (10) alevin mortality in those streams
- (11) Q All right let s - let s start with labeling these too
- (12) Now he went to as you understand it some oiled streams and
- (13) some unoled streams?
- (14) A That s right
- (15) Q So we ll label one of these as oiled?
- (16) A Yes
- (17) Q And one as -
- (18) A And the other one as unoled
- (19) Q And then what did he do? Did he figure out - well when
- (20) did he go there first to these kinds of streams?
- (21) A Well his first studies actually was just with alevins but
- (22) he went back the following year in 1989 spawning year and
- (23) looked in 1990 looked at the - at the eggs and he would have
- (24) gone in and assessed a certain square area of stream bed and
- (25) counted the number of eggs in it

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- (1) Q So for instance just to keep it simple here shall we just
- (2) use a round number?
- (3) A Let s use a thousand eggs
- (4) Q He d go into each of the streams and he determined how
- (5) many
- (6) eggs per square unit of per square meter or something?
- (7) A That s right yes
- (8) Q How did he go about doing that? I mean how do you
- (9) determine how many eggs there are in a stream bed?
- (10) A It was the same pumping device I descnbed we used to
- (11) remove alevins in the spring of the year He would go in with
- (12) the pumping device and pump out the eggs in the fall collect
- (13) them in the same kind of net device and then he d look at the
- (14) live versus the dead in that group of eggs that would come out
- (15) Q I put a thousand down here too just to keep it simple
- (16) We re going to be basically dealing with percentages here?
- (17) A Right.
- (18) Q So what kind of thing, then just using an example not
- (19) necessarily his exact numbers but -
- (20) A Well in the unoled stream he would have found for
- (21) instance 800 live eggs and 200 dead eggs And so that would
- (22) have been 80 percent survival
- (23) Q Then he went to the unoled?
- (24) A Then he went to the unoled streams and he dug there and
- (25) had a fewer dead eggs, so he had 900 live eggs an a hundred
- (26) dead eggs as an example and 90 percent survival there

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- (1) Q What conclusion did he draw from that?
- (2) A Then he concluded that the oiled streams had higher
- (3) mortality and therefore oil must have killed the eggs
- (4) Q All right but he also then went back - we ll come back to
- (5) that portion of it but he went back in spring then of the
- (6) year?
- (7) A Then you go back to the spring of the year in the same
- (8) streams and sample them using a slightly different diagonal of
- (9) his sample so he wouldn t sample the exact same areas
- (10) Q Use the same -
- (11) A Same program
- (12) Q Same number of eggs per square whatever?
- (13) A Yes
- (14) Q What kind of thing would he come up with then give us an
- (15) example?
- (16) A Well as an example he d find 150 live alevins
- (17) Q Now we re down into the spring?
- (18) A Yes
- (19) Q So by now these - the eggs have hatched and he has these
- (20) alevins in the stream sediment?
- (21) A Right and they would be - they would be incubating
- (22) getting ready to emerge and that s about what you d expect to
- (23) find out of a thousand eggs spawned something like 150
- (24) alevins
- (25) being produced about 15 percent survival
- (26) Q That s pretty normal for pink salmon generally?

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- (1) A It's quite variable but that's within the range
 (2) Q All right Now what number do I need to write down next
 (3) here?
 (4) A Well then down in the control streams or unoled streams
 (5) went back there and counted there as well and he found that he
 (6) had 150 live alevins there
 (7) Q The same as he had in the oiled stream?
 (8) A That's right
 (9) Q And in fact is that basically correct the numbers
 (10) precise numbers may not be right but did his data show that
 (11) when he went back in the spring he had essentially the same
 (12) number of live alevins or same percentage of live alevins?
 (13) A That's right the number of live alevins the percentage of
 (14) live alevins or number was the same in the controlled streams
 (15) as in the oiled streams
 (16) Q The percentage of alevins over the number of eggs he
 (17) started out with?
 (18) A Yes
 (19) Q What does that signify about the oil impact or lack of an
 (20) oil impact?
 (21) A That's where my disagreement was with him It's really the
 (22) alevin count that matters that's the ones producing the fry
 (23) that come back as adults Those numbers are the same
 (24) between
 (25) oiled and unoled streams it doesn't much matter what you find
 (26) earlier in terms of mortality because it's the end count that

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- (1) really matters
 (2) Q What might have happened if you - if you think he's right
 (3) on his fall count and I understand that you have got a
 (4) disagreement with him on that but if we were that what that
 (5) would simply suggest because he had the same percentage
 (6) live
 (7) alevins by the time the spring rolled around there was just
 (8) some earlier mortality in the oiled streams that he was picking
 (9) up in the fall?
 (10) A Yes
 (11) Q But you'd end up at the same place by the time the spring
 (12) rolls around?
 (13) A That's right
 (14) Q Now have you in fact looked at his work in order to see
 (15) why even though he gets no difference oiled versus unoled in
 (16) the spring have you look at it to see why he's getting this
 (17) earlier mortality in the fall?
 (18) A Yes I did Now when I went to work on the project and
 (19) designed the studies with Exxon I let Exxon know that I really
 (20) wanted to use as much data as available, I was hoping
 (21) actually
 (22) that we could do combined studies with Alaska Fish & Game
 (23) and
 (24) as it turned out of course that wasn't possible but I did
 (25) ask that I use as much data as I could and that would increase
 (26) the strength of my conclusions from my data if I could use data
 (27) from others as well so my objective was to use as much data
 (28) from the Alaska Fish & Game studies as I could

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- (1) Q Incidentally that reminds me Did your embryo survival
 (2) study basically try to look at the same sort of thing?
 (3) A Well the difference was we went through the hatching stage
 (4) with our embryo study and Mr Bue only went three weeks after
 (5) spawning or thereabouts after spawning with his egg study but
 (6) it overlapped Ours overlapped his and of course if there had
 (7) been effect of oil we should have seen it in the embryo
 (8) studies and we didn't
 (9) Q You were a bit puzzled why he was seeing this fall
 (10) mortality?
 (11) A That's right
 (12) Q So can you tell us what you've done in order to try to see
 (13) what may be influencing that fall mortality that he comes up
 (14) with?
 (15) A Well yes I think that can be best expressed in the next
 (16) exhibit
 (17) Q I tell you what, before we do that let me ask you one
 (18) other question couple questions here Did he find - did he
 (19) do this in 1990 both fall and spring?
 (20) A Yes
 (21) Q And in 1991?
 (22) A Yes
 (23) Q And in 1992?
 (24) A Yes
 (25) Q And in all three years did he find - seemed like he

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- (1) found?
 (2) A He found
 (3) Q A fall mortality difference?
 (4) A Fall mortality difference but not only a difference but it
 (5) appeared to be increasing in both controlled and oiled
 (6) streams
 (7) Q How about his spring mortality then in all three years
 (8) were they basically essentially the same?
 (9) A The same yes
 (10) Q And do you know - incidentally you have seen what
 (11) conclusion he draws from the fall egg mortality differences
 (12) that he found?
 (13) A Well I have on my next exhibit the alevin data from his
 (14) streams I went to his report and in - in the - in the
 (15) appendix of his report he has the data from his streams live
 (16) and dead counts
 (17) Q All right do we have an exhibit on that one?
 (18) A I have an exhibit on that I planned an exhibit on that.
 (19) Q Well, let me see Actually before we get to that there's
 (20) one other thing I wanted to ask you about in here
 (21) A Okay
 (22) Q At the time of the spill were ADF&G people already out in
 (23) the field just by happenstance looking at embryo mortality?
 (24) A Not by happenstance but before the spill they were making
 (25) their normal fall stream assessments and - pardon me spring

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- (1) assessments before the - before the spill
 (2) Q All right
 (3) A And so they were going out to look at alevin survival in
 (4) these streams as part of the routine to get numbers to predict
 (5) what the next run size would be coming from those fish
 (6) Q And what happened after the spill then? Did they go
 (7) back?
 (8) A Well the oil spill came and of course it was a great
 (9) concern to everybody and so they thought this was an
 excellent
 (10) opportunity to go back and try to assess damage so they went
 (11) back to the streams they had sampled in the pathway of oil
 (12) prior to the spill and resampled those
 (13) Q So here s a situation where we ve got a prespill and a
 (14) post spill comparison?
 (15) A Yes that s right
 (16) Q Which is kind of unique I guess?
 (17) A Yes
 (18) Q That didn t happen too often?
 (19) A You wouldn t want to design that but that s kind of good
 (20) Q You have an exhibit which shows the results?
 (21) A I have an exhibit of that too
 (22) Q And that I believe is DX8682 You want to explain - well
 (23) let s see On this exhibit you ve got density of dead fry on
 (24) the left hand axis here?
 (25) A Yes that s correct That would be the number or the

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- (1) density of dead fry on the left and the prespill oiled streams
 (2) is the red column so that s this one here
 (3) Q And so they were getting what about 14 to 15 -
 (4) A About 15 percent
 (5) Q Dead fry?
 (6) A And -
 (7) Q Is that in percentage or is that in absolute numbers on the
 (8) left hand side there?
 (9) A That - I can t - I don t actually interpret what I ve got
 (10) here in terms of the -
 (11) Q We could probably find the answer out to that overnight,
 (12) but the -
 (13) A But anyway I ve got the general number of - of the
 (14) prespill situation compared to the post spill situation and
 (15) there s essentially no difference between these two levels
 (16) Q Now when you say essentially now it looks like there s
 (17) some difference?
 (18) A Yeah it was actually a little bit lower mortality in
 (19) the - in the stream after the spill But that s
 (20) insignificant and the point is that this is a stage of
 (21) alevins they re very sensitive to oil at this stage In fact
 (22) this is the most sensitive stage of the incubating alevin
 (23) including the egg stage and the alevin stage, the most
 (24) sensitive to oil So if you re going to expect to find any
 (25) effect from oil exposure we should have found it here in

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- (1) 1989
 (2) Q And what did this tell you about your own findings and
 (3) Mr Bue s findings that in the spring if you came back in the
 (4) spring you had essentially no difference between the oiled and
 (5) the unoiled streams?
 (6) A Well that certainly confirmed the alevin spring
 (7) assessment
 (8) Q All right Now let s go back we were talking we were
 (9) about to get into the subject of why you believed that his fall
 (10) numbers were probably not showing the true picture is that the
 (11) right phrase?
 (12) A Yes I feel that his experimental design was actually
 (13) responsible for the mortalities he was getting He was
 (14) essentially killing the eggs by his sampling procedure
 (15) Q Can you explain why you believe that?
 (16) A Yes The next exhibit I have is on the sensitivity during
 (17) incubation period to the toxicity of oil
 (18) Q I believe that is Defendants 8788-A is that the one?
 (19) A That s correct.
 (20) Q Could you explain what this signifies?
 (21) A This shows the most susceptible period to the effect of oil
 (22) toxicity occurs after the hatching period and actually
 (23) increases over this period during incubation as the alevin is
 (24) absorbing its yolk and becomes most susceptible to
 hydrocarbons
 (25) late in the incubation period just before emergence

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- (1) Q Now, this is information that is based on studies that were
 (2) done by NOAA national oceanic -
 (3) A Yes And Auke Bay over the years where they ve looked at
 (4) sensitivity of alevins and fry and eggs to oil and the
 (5) important point here that I want to show with this display is
 (6) the lack of sensitivity of the egg stage That s this blank
 (7) area here during the egg stage - you re going to have to put
 (8) it back there for me Sorry
 (9) Q Rob s pretty good at making up for our errors here
 (10) A This stage is the egg stage and that s the most insensitive
 (11) period to the presence of hydrocarbon toxicity And the reason
 (12) for it is because it s - the egg is encapsulated with a fairly
 (13) thick little eggshell and the eggshell actually protects it
 (14) from toxicants that try to get into the yoke material of the
 (15) embryo or into the - into the egg and it helps isolate those
 (16) from getting in And once it hatches that protective barrier
 (17) is gone and that s why the alevin becomes more susceptible to
 (18) oil
 (19) Q So the fact that these studies show that the eggs are not
 (20) very sensitive to oil you felt that conflicted with Mr Bue s
 (21) findings that there was higher egg mortality?
 (22) A Yes And so that made me look at what else could it be
 (23) if - because it shouldn t be from oil toxicity
 (24) Q Where did that inquiry lead you then?
 (25) A I then looked at how soon he was sampling his eggs after

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- (1) spawning
- (2) Q And why were you interested in that?
- (3) A Because the eggs go through a developmental process that
- (4) makes them extremely sensitive to physical movement we call
- (5) that shock If the eggs in a hatchery for instance are
- (6) moved it will kill them during that period of sensitivity It
- (7) lasts from about 48 hours after fertilization depending on
- (8) temperature up to 20 25 even 30 days after fertilization so
- (9) it s that period of extreme sensitivity to shock If the egg is
- (10) moved you can kill it
- (11) So hatchery men leave their eggs absolutely untouched until
- (12) that time if they can - if they can get away with it and
- (13) don t remove the dead eggs until after that period which we
- (14) called the eyed stage when the little embryo is starting to
- (15) show its eye
- (16) MR COOPER Your Honor I see it s 2 00 straight up
- (17) THE COURT We will adjourn at this time ladies and
- (18) gentlemen Please don t read look at listen to anything
- (19) about our case We will reconvene at 8 00 tomorrow morning
- (20) I would like to see in chambers briefly at this point our
- (21) lead counsel so that I can discuss a couple of things that have
- (22) come up during the course of the day In recess now
- (23) (Recess at 2 00 p m)

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- (1) EXHIBITS
- (2) DX5099 DX5111 A DX5120 DX7441 DX8423 DX8424
- (3) DX8477 A DX8681 DX8762 DX8787 A DX8899 DX1820
- (4) DX1821 A and DX8658 A offered 5569
- (5) 1969 offered 5584
- (6) 5355-B offered 5617
- (7) 5328 B offered 5619
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- (10) 1957 A offered 5622
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- (12) 8656-A offered 5635
- (13) DX5719-B and DX1368 offered 5643
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- (17) DX5715 DX5714 and DX5717 A offered 5659
- (18) DX5723 A offered 5661
- (19) DX5722 B offered 5663
- (20) 5720-A offered 5668
- (21) DX8888 offered 5669
- (22) DX5120 offered 5727
- (23) DX0127 B offered 5730
- (24) DX1820-A offered 5738
- (25) 8681 offered 5738

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- (1) INDEX
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- (3) BY MR O NEILL 5570
- (5) REDIRECT EXAMINATION OF DR DAVID PAGE
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- (8) DIRECT EXAMINATION OF DR JERRY NEFF
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- (11) CROSS EXAMINATION OF DR JAMES NEFF
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- (2) 8898-A offered 5745
- (3) DX5108 offered 5755
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- (6) DX5099 offered 5764
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- (11) 1969 received 5584
- (12) 5355-B received 5617
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- (20) 8895 received 5656
- (21) 8888 received 5657
- (22) 5708-A received 5659
- (23) DX5715 DX5714 and DX5717 A received 5660
- (24) DX5723-A received 5662
- (25) DX5722-B received 5663

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- (1) STATE OF ALASKA)
 (2) Reporter s Certificate
 (3) DISTRICT OF ALASKA)
 (6) I Joy S Brauer a Registered Professional
 (7) Reporter and Notary Public
 (8) DO HERBY CERTIFY
 (9) That the foregoing transcript contains a true and
 (10) accurate transcription of my shorthand notes of all requested
 (11) matters held in the foregoing captioned case
 (12) Further that the transcript was prepared by me
 (13) or under my direction
 (14) DATED this day
 (15) of 1994
 (21) JOY S BRAUER RPR
 Notary Public for Alaska
 (22) My Commission Expires 5 10 97

Look-See Concordance
Report

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UNIQUE WORDS 3,342
TOTAL OCCURRENCES
16,607
NOISE WORDS 385
TOTAL WORDS IN FILE
47,335

SINGLE FILE CONCORDANCE

CASE SENSITIVE

NOISE WORD LIST(S)
NOISE NOI

INCLUDES ALL TEXT
OCCURRENCES

IGNORES PURE NUMBERS

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() IN THE UNITED STATES DISTRICT COURT
) FOR THE DISTRICT OF ALASKA
 In re) Case No AB9 0095 CIV (HRM)
) Anchorage Alaska
 The EXXON VALDEZ) Thursday June 30 1994
) 8 00 a m
 TRANSCRIPT OF PROCEEDINGS
 TRIAL BY JURY 37th DAY
 (10) BEFORE THE HONORABLE H RUSSEL HOLLAND JUDGE
 VOLUME 33 Pages 5785 6020
 () Realtime Transcription
 (13) A P P E A R A N C E S
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(1) P R O C E E D I N G S
 (2) (Jury in at 8 00 a m)
 (3) (Call to Order of the Court)
 (4) THE COURT Good morning ladies and gentlemen This
 (5) is the continuation of trial in case AB9 0095 civil in re the
 (6) Exxon Valdez We had Dr Brannon I believe up yesterday if
 (7) he could resume the stand please
 (8) Dr Brannon you understand you re still under oath?
 (9) THE WITNESS Yes I do
 (10) THE COURT You may proceed Mr Cooper
 (11) MR COOPER Thank you Your Honor Your Honor
 (12) there s one or two housekeeping items that s occurred to me
 (13) We ve used this large posterboard chart of the life cycle We
 (14) have a smaller version of that Exhibit 8477 which I would
 (15) like to admit into evidence
 (16) (Exhibit 8477 offered)
 (17) THE COURT Is there objection?
 (18) MR JAMIN No objection Your Honor
 (19) THE COURT Thank you Defendants Exhibit 8477 is
 (20) admitted
 (21) (Exhibit 8477 received)
 (22) MR COOPER Thank you Your Honor If memory serves
 (23) me right I had not requested the admission of Exhibit 8788 A
 (24) That s the one that dealt with mortality the toxic shock
 (25) (Exhibit 8788 A offered)

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 Midnight Sun Court Reporters
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(1) MR JAMIN No objection
 (2) THE COURT Defendants Exhibit 8788 A is also
 (3) admitted
 (4) (Exhibit 8788 A received)
 (5) CONTINUED DIRECT EXAMINATION OF DR ERNEST
 BRANNON
 (6) BY MR COOPER
 (7) Q Dr Brannon let me go back to one of the exhibits that we
 (8) were talking about yesterday DX8682 and this is if I recall
 (9) the one where you were pointing out that the density of dead
 (10) fry in streams right after the spill was not as great as it was
 (11) in streams just before the spill?
 (12) A Yes
 (13) Q And I think we had - I had asked you a question about the
 (14) vertical scale on the left Have you had a chance to refresh
 (15) yourself on what that vertical scale - what units that s in?
 (16) A That s right It s density of dead fry per square meter of
 (17) stream
 (18) Q So the oiled streams on the right side or the post spill
 (19) density in the - for instance post spill there were what
 (20) it looks like about perhaps 12 dead fry per square meter?
 (21) A That s right
 (22) Q And prespill just before the spill there was - there was
 (23) a higher number?
 (24) A Yes But my point was that they were really not
 (25) different If there was going to be an oil effect from the

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- (1) sensitivity of alevins to oil and they are the most sensitive
 (2) stage during incubation the late alevins prior to emergence
 (3) One would expect that to be an elevated level and I don't see
 (4) any difference there In other words it's not - while it
 (5) shows a slightly smaller mortality 14 versus 12 is so close
 (6) that it's really not different
 (7) Q Now were there other streams that they looked at post
 (8) spill?
 (9) A Well they had looked at a bank of streams in anticipation
 (10) that the oil was coming and they looked at at least six more
 (11) streams but they didn't have prespill information on them
 (12) Q When they looked at those post spill what did they find?
 (13) A The mortality was no greater than ones they looked at in
 (14) fact was a little bit less than what they looked at
 (15) Q All right Now I think yesterday we were - when we left
 (16) off we had been talking about this situation where Mr Bue
 (17) found more or higher mortality embryo mortality in the fall
 (18) even though in spring it looked like there was no difference
 (19) and I believe you were explaining to us why you believe he
 (20) found that number of elevated higher mortality in the oiled
 (21) streams in the fall Do you remember that general subject
 (22) matter?
 (23) A Yes the egg mortality
 (24) Q Yes egg mortality And I think we had - well I believe
 (25) we were about to talk about or maybe had begun talking about

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- (1) Exhibit 8787 A You had explained that at some early stage
 (2) after fertilization pink salmon eggs are sensitive to physical
 (3) shock?
 (4) A Yes They're sensitive to physical shock and insensitive
 (5) to chemical shock
 (6) Q And before that shock which is part of the mystery we've
 (7) been talking about you've got Exhibit 8787 A - 8787 A can
 (8) you explain now what you're depicting in this exhibit?
 (9) A My light pencil okay This part of the figure shows
 (10) the -
 (11) Q Maybe we better start if I can interrupt you Dr Brannon
 (12) what do we have on the bottom axis going along the bottom?
 (13) A This is the days after fertilization showing from - the
 (14) day of fertilization would be at zero and then we go on to the
 (15) 200 days of incubation That would be representative of a
 (16) incubation period for pink salmon
 (17) Q So as we go to the right we're increasing in time from
 (18) the -
 (19) A Yes And so late in the incubation phase during this
 (20) period here you're going to have the effect of oil toxicity
 (21) most pronounced and in this phase right here you're not going
 (22) to have any oil toxicity as we showed on the previous figure
 (23) but we do have a very high sensitivity to shock
 (24) Q Physical shock?
 (25) A Physical shock moving the eggs at this period when the

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- (1) yolk is still just covered by a very thin membrane rather than
 (2) a thicker epidermis or skin and that lasts from 48 hours after
 (3) fertilization to about 20 or 25 days after fertilization
 (4) Q And that is because the egg or the embryo just isn't
 (5) completely protected yet by this - what did you call it?
 (6) A Yeah this membrane
 (7) Q Membrane?
 (8) A Yeah And the membrane is covering the yolk and the
 (9) thicker epidermis or skin that gives it some tolerance to shock
 (10) is absent at that point
 (11) Q What we're talking about here is days after fertilization
 (12) or after the spawn basically?
 (13) A Yes
 (14) Q So now you've explained that there is this period of
 (15) heightened or very high sensitivity for the first few days?
 (16) A Just to physical shock
 (17) Q To physical shock?
 (18) A Right
 (19) Q Now what's the next step in your reasoning to lead you
 (20) that Mr Bue was wrong in his egg mortality work?
 (21) A He was sampling in that time period for some reason I
 (22) think because they wanted to get a lot of streams covered and
 (23) so they probably started earlier so he was sampling within the
 (24) sensitive period of those eggs too close to the time that the
 (25) last of the spawn was occurring

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- (1) Q In the - this time period that I've outlined in blue here?
 (2) A That's correct yes
 (3) Q Now when you sample for these eggs does that subject
 (4) them
 (5) to physical shock?
 (6) A Yes very very severe shock
 (7) Q And I think you have - you brought a video with you that
 (8) shows the sampling operation?
 (9) A Yes I brought a video that is the characteristic type of
 (10) sampling done to remove alevins or eggs from the gravel
 (11) Q This is the method that Mr Bue used?
 (12) A That's correct
 (13) Q This isn't his actual work?
 (14) A No it's not This is actually our alevin crew in the
 (15) spring of the year but it's the same process that's used for
 (16) egg removal
 (17) MR COOPER Your Honor with the Court's permission
 (18) I'd like to show that video It's Exhibit DX1821
 (19) THE COURT Is there objection to 1821?
 (20) MR JAMIN No objection
 (21) THE COURT Very well Defendants Exhibit 1821 is
 (22) admitted and may be played
 (23) (Exhibit 1821 received)
 (24) (Videotape Played)
 (25) THE WITNESS This is the pumping operation on a
 stream and you see the pumping and the digging crew They got

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- (1) their - they got their net around the area they re going to be
 (2) washing the alevins out of the gravel with That s the pump
 (3) and these are the station men that would be pulling the
 (4) material around the stream and putting the box around the redd
 (5) site or nest site and probing into the water jetting into the
 (6) gravel and washing the eggs and the gravel out of the nest into
 (7) the collection trap on the net which shows there the screen or
 (8) the netting going down to a little collection box And as the
 (9) eggs come out with water and silt they ll be washed down into
 (10) that collection box
 (11) This shows what you have to do to probe make sure you get
 (12) all of the eggs or alevins out of the gravel spot that you re
 (13) digging in So that s - that s very severe shock and if you
 (14) drop an egg just three or four inches above water in the water
 (15) that will kill it at this stage and so that - that amount of
 (16) shock is very severe
 (17) (Videotape over)
 (18) BY MR COOPER
 (19) Q Now have you looked at the timing when Mr Bue was out
 (20) sampling the streams in the fall to see how it might correlate
 (21) with this area of very high sensitive?
 (22) A Yes I did Mr Bue was thorough enough to leave his data
 (23) in his appendices and that made it available to look at and
 (24) retrace his steps and so I took that data and looked at the
 (25) timing element of it

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- (1) Q And that - there s information in that data that leads you
 (2) to think that he was sampling during this period of extreme
 (3) sensitivity early on?
 (4) A Yes He shows his date of initial sampling and his end
 (5) date of sampling in that process
 (6) Q I d like to show you Exhibit 1817 C which I believe is one
 (7) that you have utilized to demonstrate this phenomena Does
 (8) this exhibit explain what you were just talking about?
 (9) A Yes The red little marks there are the - that sample
 (10) date on the bottom of the figure and you ve got percent
 (11) mortality on the vertical axis of the figure so you ve got
 (12) mortality on this axis and date of sampling on this axis and
 (13) then the little red dot is the actual percentage mortality that
 (14) would have been calculated from that particular date
 (15) Q Maybe it would help if you could just circle one of those
 (16) dots and then explain how or what that means on each of the
 (17) scales?
 (18) A Yes There would be one dot there would be another one
 (19) another one - each one of those would be a separate percent
 (20) mortality from one of his digs
 (21) Q So for instance on that first dot that you marked there
 (22) this one right here that means that that was a - a sample
 (23) that he took from one of the streams going down to the bottom
 (24) scale what about late October or late September early
 (25) October?

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- (1) A That s correct
 (2) Q And in that stream he found an 80 percent mortality rate?
 (3) A Yes
 (4) Q So the more these dots are grouped over here high and on
 (5) the left that means the higher the mortality and the earlier
 (6) they were sampled?
 (7) A Yes that s correct And the blue line is the best fit
 (8) curve showing the relationship with time
 (9) Q That s a statistical method of -
 (10) A Yeah just simple mathematical best fit curve
 (11) Q So with respect to this group that I m circling in red
 (12) those samples were demonstrated - tended to demonstrate a
 (13) lower mortality than the earlier ones?
 (14) A Yes they did and those very early have a very high
 (15) mortality
 (16) Q Whereas the ones along the - the ones in this group have
 (17) lower mortality and they re later samples?
 (18) A That s correct That shows the effect of sampling too
 (19) early in the streambed when those eggs are still sensitive
 (20) And sensitivity once it s over at that 20 to 25 day period it
 (21) drops down rather quickly so it s not a transition that occurs
 (22) over weeks but just over a day even a couple days would
 (23) make
 (24) a difference in that - in an individual egg s sensitivity
 (25) Q Is that because within that period of time the last bit of
 otherwise vulnerable egg -

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- (1) A That s right
 (2) Q - is closed up in that membrane?
 (3) A Yes that s correct
 (4) Q This shows the later he sampled the less mortality he had
 (5) and vice versa How do you know whether or not he was
 (6) disproportionately sampling too early in the oiled streams as
 (7) opposed to the unoled streams?
 (8) A My next exhibit demonstrates that and it shows the timing
 (9) of the fish returning to the spawning streams in the oiled
 (10) versus the unoled streams
 (11) MR COOPER If we could have Exhibit 8689 While
 (12) that s happening Your Honor I would move to admit the exhibit
 (13) that we were just looking at
 (14) (Exhibit 1817 C offered)
 (15) THE COURT Is there objection to 1817 C?
 (16) MR JAMIN There is not Your Honor
 (17) THE COURT 1817 is admitted
 (18) MR COOPER Thank you Your Honor
 (19) THE COURT 1817 C
 (20) (Exhibit 1817 C received)
 (21) BY MR COOPER
 (22) Q Now what have you got on the - can you explain what this
 (23) graph is showing?
 (24) A Yes The red line is the unoled stream adult return time
 (25) and they start coming into the stream towards the first middle

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- (1) part of August and the - peaks in the unoled stream around
 (2) the middle of August and then tapers off towards the first
 (3) part middle of September And the blue line shows the salmon
 (4) returning to the oiled streams and you can see that that -
 (5) those populations come in a little bit later They peak in the
 (6) populations - in other words the greatest number of fish in
 (7) the stream occurs in oiled streams about two weeks after it
 (8) occurs in the unoled streams and then it - it tapers off and
 (9) remains fairly high until the first part - or the middle part
 (10) to the end of September
 (11) Q Now I notice on the left hand side here you say percent
 (12) escapement What does that tell you about the time that these
 (13) embryos or these eggs were deposited?
 (14) A Well the percent escapement is simply the number of fish
 (15) that are entering the stream and that percent escapement into
 (16) the stream then for instance at the peak of the unoled
 (17) stream arrival time about 22 percent of the population will be
 (18) represented at that date and on the peak of the oiled stream
 (19) which occurs two weeks later the - that represents about 40
 (20) percent of the population being in the stream on that date
 (21) So the point is if you sample here towards the end of
 (22) September you can see that the number of eggs sensitive to
 (23) shock in the oiled streams is at least twice maybe three times
 (24) higher than the number of eggs sensitive to shock in the
 (25) unoled streams

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- (1) Q Then that would account for why he was getting the higher
 (2) egg mortality embryo mortality in the oiled streams as opposed
 (3) to the unoled?
 (4) A That's right And this progressed In fact as he
 (5) progressed from 89 90 91 he was progressed earlier in the
 (6) season in 1991 than he was in 89 which tends to increase the
 (7) number of sensitive fish he's intercepting and killing
 (8) unknowingly and of course then arriving at the conclusion that
 (9) for some reason mortality's increasing in the streams with
 (10) time when in fact it was his sampling time that was changing
 (11) Q That would also explain why then even though he got this
 (12) higher mortality which was as I understand what you're
 (13) saying basically a false reading because it was being created
 (14) just by the shock of pumping these eggs out even though he
 (15) got that higher mortality then in the spring measurements oiled
 (16) and unoled was the same?
 (17) A That's right and they should be because if it's an
 (18) artificial mortality you'd expect to see the same survival in
 (19) the spring Mr Bue was sampling about a month earlier in his
 (20) streams than what they'd done historically back in the 70s
 (21) even
 (22) Q Was there a time when ADF&G did sample for embryo
 (23) mortality just as a matter of course in Prince William Sound?
 (24) A Yes They were testing that as a mechanism to use for
 (25) prediction of survival in the spring and therefore use it as a

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- (1) prediction for the next brood year survival and they abandoned
 (2) that and used just the fall - pardon me just the spring
 (3) alevin sampling period
 (4) Q But when they were looking at that embryo mortality in the
 (5) fall were they out looking as soon after the spawn as Mr Bue
 (6) was?
 (7) A I'm probably mixing you up
 (8) Q That's easy to do
 (9) A The fall would have been the egg sampling and the spring
 (10) would have been the alevin or fry sampling and they've gone
 (11) just to the fry sampling because that gives them the best
 (12) estimate of course and the egg sampling in the fall has been
 (13) discontinued
 (14) Q Just discontinued completely?
 (15) A To my knowledge yes
 (16) MR COOPER Your Honor I would ask that we admit
 (17) this latest exhibit
 (18) (Exhibit 8689 offered)
 (19) THE COURT Is there objection to -
 (20) MR JAMIN 8689 is fine Your Honor
 (21) THE COURT Defendants Exhibit 8689 is admitted
 (22) (Exhibit 8689 received)
 (23) BY MR COOPER
 (24) Q Dr Brannon I've got about two or three more subjects and
 (25) we can probably get through them fairly quickly What I'd like

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- (1) to turn your attention to now is a question or a matter that
 (2) was raised very briefly right at the end of Dr Mundy's
 (3) testimony and he made a reference to - there was a reference
 (4) made to a question of whether there may be any genetic
 (5) damage
 (6) that was done by the oil
 (7) Now is this a matter that you've considered also?
 (8) A Oh yes Our egg viability studies were designed to look
 (9) at long term or genetic effects
 (10) Q Now those studies you've already described and I don't
 (11) want to go over those in much detail but that's the one
 (12) that - one that the arrow's pointing to here?
 (13) A Yes That would have been - the egg viability study would
 (14) have been examination of the egg survival from those adults
 (15) that had been exposed and were at highest risk of exposure to
 (16) oil when they were juveniles
 (17) Q All right And why would looking at the eggs from these
 (18) fish that were most potentially exposed shed any light on
 (19) whether there was any genetic problem?
 (20) A Well because the genetic damage would upset some of the
 (21) genetic mechanism in the eggs chromosomes or the actual
 (22) sequences in the DNA and as a result when the eggs were
 (23) fertilized by the male the probability of a high mortality
 (24) associated with that genetic damage would be demonstrated
 (25) there
 (26) most readily
 (27) Q So if all of the things that have to happen for a damaged

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- (1) gene to manifest itself in a problem in the offspring if all
 (2) of those things happen you would expect to see some
 indication
 (3) of that or a clue to that would at least be how did the eggs
 (4) do?
 (5) A That's right In our hatchery experience we can see that
 (6) if the eggs are bad for some reason they usually occur as more
 (7) total Sometimes they'll last to the alevin stage before they
 (8) die We do get some deformities lasting to the yolk
 (9) absorption but that incubation phase is where most of the
 (10) mortality associated with any genetic damage would occur
 (11) Q All right And you also looked at the egg viability for
 (12) the even year brood or odd year brood as well?
 (13) A Yes So we examined that with regards to their exposure
 (14) history one having the exposure history in the incubation
 (15) gravel primarily and the other having the exposure during the
 (16) early marine phase of their growth And in both cases those
 (17) fish at greatest risk came back and spawned eggs that were
 (18) highly viable
 (19) Q And you couldn't detect any difference between those that
 (20) returns to the oiled versus the unoled streams?
 (21) A That's correct
 (22) Q So is it your conclusion from that then that there was
 (23) not likely any significant genetic damage that impacted these
 (24) populations?
 (25) A Well certainly the eggs demonstrated that but you have to

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- (1) look at the very large adult return of those years at greatest
 (2) risk so 1990 91 adults came back at very large numbers and
 (3) both hatcheries primarily hatcheries but also very well into
 (4) the wild environment and that would indicate lack of - of
 (5) long term genetic damage
 (6) Q Now let's turn to another subject although we've kind of
 (7) been turning on it what you've been saying obviously bears on
 (8) it but the subject of the 1992 and 1993 very low runs can you
 (9) focus on that for a minute?
 (10) A Yes
 (11) Q Now have you given some thought to whether the low run
 (12) sizes in 1992 and 1993 were caused in substantial part or a
 (13) substantial factor was the oil spill?
 (14) A Well as I mentioned earlier in order for there to be an
 (15) effect there has to be a mechanism through which the oil is
 (16) going to have an impact on the pink salmon in question In -
 (17) 1992 and 1993 were years far past in the life histories of pink
 (18) salmon far past the time of the spill or the potential
 (19) exposure displaced by at least a generation from the exposure
 (20) time so one would have to ask what is the mechanism for such
 (21) an impact And because the - both the brood years were
 (22) exposed to oil at different times in their life history you
 (23) then expect if it wasn't - if there was an effect it would
 (24) occur in one brood year over the other and both 92 and 93
 (25) were low return years well displaced from the point of the oil

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- (1) impact So I would conclude that there's - there's definitely
 (2) a problem in Prince William Sound but it's not related to
 (3) oil
 (4) Q The run figures are Sound wide as you understand it?
 (5) A Well when you look at the fishery the entire Sound is
 (6) down yes
 (7) Q Did you also give any consideration in thinking about this
 (8) question whether or not the oil could be responsible for the
 (9) low run sizes did you give any consideration to the
 (10) relationship between the wild stock and the hatchery fish?
 (11) A Yes I did Because the hatchery fish were excluded from
 (12) exposure during the incubation phase and during the early
 (13) rearing phase from oil one would expect then if there was
 (14) some kind of effect you would see it in the most vulnerable
 (15) group of fish in the - in the Sound That most vulnerable
 (16) group would be the wild fish and even within the wild fish it
 (17) would be within that group that was in the oil impacted
 (18) districts
 (19) Q All right And have you prepared an exhibit to help look
 (20) at that issue?
 (21) A Yes I have
 (22) MR COOPER Could I have DX5114 A?
 (23) I'm sorry DX5111 A
 (24) BY MR COOPER
 (25) Q All right Is this the exhibit?

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- (1) A Yes this is the exhibit It shows that the hatchery
 (2) fish - well of course we've got percent survival on the
 (3) vertical axis again here we've got percent survival and
 (4) across the horizontal axis we've got the return year and we've
 (5) got the wild stock survival shown on the red line and the
 (6) hatchery survival shown on the green line
 (7) And the point is here that after the advent of the spill
 (8) we see the same population trend in both the wild and the
 (9) hatchery fish and the same kind of drop in 1992 - I don't have
 (10) 1993 on here but it would be a continuation of those lines on
 (11) kind of a flat line at the bottom there to 1993 We see the
 (12) same trend in both hatchery and wild populations indicating
 (13) that whatever it is that's bothering those fish in Prince
 (14) William Sound it's impacting the whole of the Sound not just
 (15) one group hatchery or wild fish
 (16) Q And it doesn't - it doesn't look like it was
 (17) disproportionately affecting the wild stock as compared to the
 (18) hatchery fish?
 (19) A No it doesn't
 (20) Q Which is what you would expect if the spill were the
 (21) culprit given the fact that the hatchery fish are more
 (22) protected from oil for the reasons you've talked about?
 (23) A Yes
 (24) Q Now have you also in thinking about this question as to
 (25) what might account - or whether the oil might account for the

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- (1) low runs in 1992 and 93 have you looked at the wild stock run
 (2) sizes generally and the trends there?
 (3) A Yes I have
 (4) MR COOPER Your Honor before I move to that I
 (5) would move to admit DX5111 A
 (6) (Exhibit 5111 A offered)
 (7) MR JAMIN No objection
 (8) THE COURT DX5111 A is admitted without objection
 (9) (Exhibit 5111 A received)
 (10) MR COOPER Could I have DX8884?
 (11) BY MR COOPER
 (12) Q Now is this the exhibit that demonstrates this point?
 (13) A Well this exhibit shows that the problem in Prince William
 (14) Sound does not appear to have happened in 1992 or 1993 but
 (15) it
 (16) actually had occurred - started to occur prior to the oil
 (17) spill
 (18) Q Now this is dealing with wild stock and not hatchery fish?
 (19) A Yes We re looking at the even year and the brood year
 (20) It s the same - same figure that I used when I had the total
 (21) numbers of fish coming back into Prince William Sound over
 (22) the - over the 10 or 15 year period What I ve done here is
 (23) take the even years out so we can see the even year runs
 (24) those that reproduce themselves on even years and those that
 (25) reproduce themselves on odd years so you can see the trends
 there more easily and you can see in 1984 1985 the even and

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- (1) the odd years thereafter start to have a slide down
 (2) Q This was well before the spill?
 (3) A Yes It was two cycles before the spill so we see -
 (4) Q You want to use the light pen and I ll -
 (5) A Okay thank you You can see the trend starting someplace
 (6) like - so as kind of a general direction in both the even and
 (7) the odd years and so it was the next year after the primary
 (8) spawning year here and here we see a decrease
 (9) We see another decrease occurring here Then the oil spill
 (10) comes and we see an increase but it s really the abnormal
 (11) pattern in - abnormal year in the pattern and then we go back
 (12) down to the low year 1992 and 1993 So it would appear that
 (13) we were having this low trend starting - lowering trend in run
 (14) return success occurring back in 1986 and 1985
 (15) Q All right So did that then lead you to think about what
 (16) factors might account for this trend since obviously the oil
 (17) spill couldn t account for it?
 (18) A Well it was probably certainly involved but - but when I
 (19) was with the salmon commission this was always a primary
 (20) issue
 (21) of concern is what are the impacts of environmental factors
 (22) In this case - in that case it would have been the Gulf of
 (23) Georgia in Puget Sound down in Washington and British
 (24) Columbia
 (25) on the return success what is it we can use to predict return
 because we were measuring the fish so the fishery could
 harvest
 them and how do we give them the best estimate

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- (1) So we always look at a variety of factors to help us
 (2) predict that so this kind of fits into the same situation up
 (3) here in Prince William Sound i e food level or population
 (4) density or environmental temperatures Those kind of things
 (5) are always major influences on success
 (6) Q When you said at the beginning of your answer it was - it
 (7) was certainly involved what were you referring to there?
 (8) A Well this - this figure this trend here was certainly
 (9) involved in my examining that but we also looked at other -
 (10) other factors
 (11) Q Now are there other factors that you have identified that
 (12) you think are likely candidates for the downturn here in the
 (13) Sound?
 (14) A Yes
 (15) Q Can you tell us what those other factors are?
 (16) A Well certainly the food supply would be a major factor and
 (17) that is - is related to population density but it s not
 (18) dictated totally by population density If you put too many
 (19) cattle out onto a field they re going to crop the grass down
 (20) too far and if you - but if you have a bad year anyway and
 (21) there s not much grass out there you ll even have worse
 (22) circumstances So it s not just the population density but
 (23) it s related to the environmental factors that influence food
 (24) supply and growth rate
 (25) Q Well we ve actually heard earlier Dr Mundy the

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- (1) plaintiffs expert talk about some of the things that may be
 (2) going on in the Sound that have to do with this but have you
 (3) prepared an exhibit to demonstrate this food supply
 (4) phenomena
 (5) that you re talking about?
 (6) A Yes I have
 (7) MR COOPER And I believe that is DX1968 A Before I
 (8) bring that up though I should seek to admit the exhibit that
 (9) we currently have
 (10) (Exhibit 8884 offered)
 (11) MR JAMIN 8884 is fine Your Honor
 (12) THE COURT Defendants Exhibit 8884 is admitted
 (13) (Exhibit 8884 received)
 (14) BY MR COOPER
 (15) Q If I could have 1968 A is this the exhibit Dr Brannon?
 (16) A Yes, it is
 (17) Q And here you have the return year the year of the returns
 (18) on the bottom?
 (19) A That s right That would be the return year and then the
 (20) millions of fish on the vertical column here and then the year
 (21) across the bottom
 (22) Q Now where do you get the data for instance as to the
 (23) millions of fish or how many fish?
 (24) A That comes from the Alaska Fish & Game annual
 (25) management
 reports
 Q And we re talking about pink salmon? That s what kind of

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- (1) fish are here?
- (2) A Yes these are only pink salmon
- (3) Q All right And so you re showing each year the return of
- (4) the pink salmon and you indicate hatchery and - divided
- (5) between hatchery and wild stock?
- (6) A Yes So this would be the total - total return of
- (7) hatchery and wild stock coming back into Prince William Sound
- (8) showing the peak the big years 90 and 91
- (9) Q And then the disappointing low runs in 92 and 93?
- (10) A Yes And what I ve done here is take the planning plankton
- (11) measurements - this was done by the PWSAC hatchery Mr
- (12) Olsen
- (13) reported this in his report to the annual meeting of the
- (14) corporation showing the - the population of - or plankton
- (15) level that he was assessing and I took that information and
- (16) superimposed it onto the adult return population based on the
- (17) year that they would be in the marine environment feeding as
- (18) juveniles
- (19) Q So you lagged this in order to account for the time?
- (20) A That s right
- (21) Q And this is the blue line then the zooplankton density
- (22) that would be available for these juveniles?
- (23) A Yes that s right And it shows the trend in population of
- (24) pink salmon corresponds some degree to the level of plankton
- (25) available so on big years of plankton you had good return
- (26) years and on poor years of plankton you had reduced success

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- (1) in adult returns
- (2) Q And that would account for why it s a Sound wide
- (3) phenomena?
- (4) A Well it certainly would contribute to it
- (5) Q Now have you also given any thought to whether the
- (6) hatchery program may have been impacting this situation?
- (7) A Yes I have Hatcheries are a big factor now in worldwide
- (8) concerns about losses of wild populations and in fact the
- (9) tendency for populations to collapse after the hatcheries take
- (10) on a major part of their production The coho on the Oregon
- (11) coast the chinook salmon in the Columbia River the chinook
- (12) and coho salmon in the northern Skagit River northern
- (13) Washington the Skagit River in British Columbia the effect
- (14) of hatchery fish is a serious biological question now and one
- (15) that we re trying to address in my situation on the Columbia
- (16) Q And this exhibit that we have up there right now does this
- (17) indicate or did you determine from this the trend in the number
- (18) of hatchery fish over the recent years?
- (19) A I m sorry I m not quite following the question
- (20) Q Well it was a pretty lousy question What does this
- (21) exhibit that s on the screen right now indicate about the trend
- (22) in how many hatchery fish had been pumped into the Sound
- (23) over
- (24) the last few years?
- (25) A Well the gold bar is the hatchery returns and as the
- (26) hatchery returns have increased they re responding to an
- (27) increase in hatchery fry releases and while they re having

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- (1) very good survival out of those hatchery releases and I think
- (2) demonstrates how a hatchery program can be very good for a
- (3) fishery it s reaching that point now where it s becoming very
- (4) very large and is of concern to biologists managing that
- (5) fishery
- (6) Q Now in fact if I look at the harvest information on this
- (7) chart it appears that starting in 79 the runs began to - the
- (8) harvest began to get much larger Is a large part of that
- (9) attributed to this growing numbers of hatchery fish that have
- (10) been introduced into the Sound?
- (11) A That s right Generally a characteristic of hatchery
- (12) production in any hatchery situation is that as you increase
- (13) hatchery production you tend to see a decrease in the wild
- (14) population as is indicated here In the mid 80s when fewer
- (15) hatchery fish are going in the wild population was taking
- (16) advantage of those good growing conditions in Prince William
- (17) Sound and was contributing to a major part of the fishery and
- (18) as the hatchery fish increased in released density it started
- (19) showing a decrease in the wild population That follows the
- (20) same trend that you see in any of the hatchery programs down
- (21) in
- (22) Washington Oregon or British Columbia
- (23) Q About how many hatchery fish are being pumped into the
- (24) system let s say around the time of the spill 1989 those
- (25) years?
- (26) A Well the hatchery fish as I mentioned constitute over 50

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- (1) percent so you re looking at something around 700 million 650
- (2) million hatchery fish going into Prince William Sound
- (3) Q Well let s see I believe you ve also prepared a chart
- (4) that compares the weight of salmon versus the number of
- (5) hatchery fry releases?
- (6) A Yes I did this to show the effect that population density
- (7) can have on return success and return size
- (8) Q Why don t we move to that one I believe we ve already got
- (9) admitted in evidence the one that s on
- (10) MR JAMIN If 1968 is not in evidence Your Honor it
- (11) may be admitted
- (12) THE COURT Defendants Exhibit 1968 is admitted
- (13) (Exhibit 1968 received)
- (14) MR COOPER Could we have Exhibit 8762?
- (15) BY MR COOPER
- (16) Q Now this is the chart we were just talking about?
- (17) A Yes it is
- (18) Q What have you charted here?
- (19) A Here on the - on the left the vertical axis shows the
- (20) average weight of the pinks at time of harvest and along the
- (21) bottom again we have return year and the red lines show the -
- (22) the red columns show the weight of adults returning
- (23) Q So can you just pick a bar and explain what that means?
- (24) A Yes This would mean that we re looking at an average
- (25) weight of pink salmon harvested here at about four and a

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- (1) quarter pounds down here we re looking at a fish that s around
 (2) three pounds It s not marking but right there And down
 (3) here we re looking at something that s a little over two and a
 (4) half pounds around two and a half pounds
 (5) So that s the weight of the adult returning and what I
 (6) have contrasted that with as you see there s a general
 (7) reduction then in weight of adults returning as they - as
 (8) the magnitude of hatchery releases have increased This is the
 (9) blue line shown here It shows up rather poorly on this
 (10) background but that blue line right at the pencil on the
 (11) screen shows the increase in number of hatchery fish going into
 (12) Prince William Sound And so we re seeing a potential
 (13) density dependent response in adult return size The more fish
 (14) that go out beyond the threshold of maximum weight results in
 (15) a
 (16) reduced weight of adult coming back
 (17) Q And what does that suggest then about the impact of the
 (18) hatchery fish on the wild stock in the Sound?
 (19) A Well it says that they re competing not only with one
 (20) another but competing with the wild stock and that has severe
 (21) implications for their survival and also has some implications
 (22) for the harvest because usually small fish are not as
 (23) marketable as large fish Put too many out and they come back
 (24) successfully but only half size You won t have a market for
 (25) them and you would end up losing in the long run
 (26) MR COOPER Your Honor I would ask that DX8762 be

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- (1) admitted
 (2) (Exhibit 8762 offered)
 (3) MR JAMIN No objection Your Honor
 (4) THE COURT Defendants Exhibit - I m sorry was
 (5) it -
 (6) MR COOPER 8762 I believe it is
 (7) THE COURT DX8762 is admitted
 (8) (Exhibit 8762 received)
 (9) BY MR COOPER
 (10) Q You ve brought some charts with you here an exhibit that
 (11) demonstrates a similar thing in Japan?
 (12) A Yes with the Hokota chum production in Japan there is
 (13) major concerns amongst the biological folks in Japan the
 (14) hatchery people about the reduction in the size of chum
 (15) coming
 (16) back as it increased the number of chum into the system and
 (17) the
 (18) smaller size as well as the smaller number
 (19) Q Could we have 8778 A?
 (20) Now can you explain - is this basically the same kind of
 (21) a graph we were just looking at? You ve got - you re looking
 (22) at the weight trend over time?
 (23) A Yes We have the weight of the chum salmon over here and
 (24) we have the year on the horizontal axis on the figure and it
 (25) shows as we increased the number of fry going into the sea
 (26) around Hokota that the average size has decreased
 (27) Q And if we can have the next piece of that graph exhibit

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- (1) and what are you showing here?
 (2) A This was the same trend but we had previous to this
 (3) showing the size reduction again the weight of adult
 (4) returning and the year along the bottom
 (5) Q And this is Prince William Sound?
 (6) A This is Prince William Sound And the red line shows the
 (7) increase in fry going into Prince William Sound and the
 (8) tendency for the adult size to taper off as it gets in higher
 (9) population densities
 (10) Q And if we could have the - and then the next frame?
 (11) A Well this is the growth pattern of the whole population in
 (12) Japan in - as you can see the number of adults has been going
 (13) up and reaching a peak there in 90 91 and then they re
 (14) concerned because they ve seen this drop off this part of the
 (15) curve towards these last few years and that s related to the
 (16) small - that s corresponding to the small size as well So
 (17) they re getting a small size and now a reduction in number of
 (18) chum salmon coming back into the fishery
 (19) Q And if we compare that to Prince William Sound?
 (20) A And now if we look at the adult return in millions here as
 (21) we did in the chum salmon situation and we look at the
 (22) horizontal axis the years we can see that this trend with
 (23) the exception of 90 91 started back there in the 87 85
 (24) era And we ve seen that kind of a slide down to the present
 (25) time the same kind of a situation that they re concerned about

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- (1) in Japan and - and of course they re puzzled as we are
 (2) puzzled because as you increase numbers of fish going out if
 (3) the year is good and is very productive you might still get
 (4) good returns But if you have a poor year the probability of
 (5) having a poor return is much greater then and so as you
 (6) increase your fry production you re increasing the chance of
 (7) having run failure in the future
 (8) Q Now Dr Brannon are you saying that you know for a
 (9) certainty that it s this increasing number of hatchery fish
 (10) that are responsible for the low runs in 92 and 93?
 (11) A No I m really saying that there s several factors
 (12) involved Food supply is one population density is another
 (13) And these relationships are not just indicators but serious
 (14) indicators that we have to be concerned about the number of
 (15) fish we re putting out in this case in Prince William Sound
 (16) and the impact that those numbers have upon themselves even
 (17) as
 (18) they migrate around the perimeter of the north Pacific because
 (19) they interact amongst themselves certainly and they also
 (20) interact amongst the other species out there
 (21) Q One last point on the run sizes in 93 and 94 - 92 and
 (22) 93 We don t know the run size I guess in 94 quite yet
 (23) do we?
 (24) A Not quite yet
 (25) Q Is there any information about that?
 (26) A The Solomon Gulch is of course an early run coming back

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- (1) Q This is Solomon Gulch area of the Sound?
- (2) A Yes That's Valdez harbor in fact so that's right up in
- (3) the most eastern part of the Sound and the catches thus far
- (4) they've caught there there are about a half a million fish
- (5) right now coming back to Prince William Sound headed for the
- (6) hatchery It's hatchery fish coming back It's an early run
- (7) so they - it's about - probably about two to three weeks in
- (8) the cost recovery fishery which they're allowed to have early
- (9) to cost recover for the hatchery operations They're well into
- (10) that at about a half a million fish
- (11) Q How does that look? Are you able to say that looks good
- (12) bad -
- (13) A I just don't know enough about Solomon's return They're
- (14) looking at four or five million fish and they're well on their
- (15) way It's early earlier than they expected Maybe that's an
- (16) indication it's a big run or maybe it's a small early run I
- (17) don't know
- (18) Q At any event by the time the trial is over we won't have
- (19) the returns yet on all these various runs?
- (20) A That's right
- (21) Q One last thing on this point You understand do you not
- (22) that the plaintiffs are claiming that the shortfall between
- (23) what ADF&G has predicted for runs in Prince William Sound this
- (24) year and what they believe will actually occur or has
- (25) happened - let me back up a minute

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- (1) 92 and 93 plaintiffs are claiming that the oil spill is
- (2) responsible for the shortfall between what ADF&G predicted
- (3) were
- (4) going to come into the Sound and the number that actually
- (5) came
- (6) into the Sound?
- (7) A Yes I understand that
- (8) Q And have you looked at the accuracy of ADF&G forecasts
- (9) generally?
- (10) A Yes We - we are always plagued by our accuracy of
- (11) forecasts with all the species
- (12) Q And the ADF&G is not - the ADF&G forecasts are no worse
- (13) than any other forecasts I assume?
- (14) A Not much worse We always took pride on the Fraser River
- (15) that our forecasts were very good and I think the fishermen
- (16) agree that they were very good but we also had our
- (17) variabilities But as you get into bigger more complex
- (18) systems like we have in Alaska with many many fishing areas
- (19) and many many many streams in those fishing areas it's
- (20) difficult to be accurate
- (21) Q It's just hard to be accurate no matter how good you are at
- (22) it?
- (23) A That's right yes
- (24) MR COOPER Let's see I'll move to admit DX8778 A
- (25) (Exhibit 8778 A offered)
- (26) MR JAMIN No objection
- (27) THE COURT No objection that exhibit is admitted

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- (1) (Exhibit 8778 A received)
- (2) BY MR COOPER
- (3) Q If we could bring up DX9360 this is the exhibit that
- (4) demonstrates the accuracy of the forecast?
- (5) A Well this is the difference between the actual run size
- (6) and the predicted run size as a percent of the forecast run
- (7) So if you were for instance off by - if you estimated 40
- (8) million fish and only 20 million fish came back you'd be off
- (9) by 50 percent If 60 million fish came back you'd be off by
- (10) 30 percent So this is showing the difference in forecasts and
- (11) actual as a percent of the forecast
- (12) Q So for instance if we just take one of these in 1986 I
- (13) guess it goes through the blue?
- (14) A Yes Prince William Sound here is the yellow column and
- (15) the other columns represent other fishing districts in Alaska
- (16) but all pink salmon
- (17) Q So for instance on the yellow one here that I'm pointing
- (18) to that indicates that the prediction or the forecast the
- (19) actual run size was only about what -
- (20) A 50 percent of the forecast It came in half as large as
- (21) they anticipated
- (22) Q Now let's see going this direction when you've got an
- (23) overprediction - you can never have more than a hundred
- (24) percent of an overprediction right? You'd never be more than
- (25) a hundred percent off? If none of the fish came back you'd be

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- (1) a hundred percent off?
- (2) A That's right yeah
- (3) Q On the other hand in - looks like Southeast Alaska the
- (4) red?
- (5) A Yes south Southeast right
- (6) Q The runs there came in larger than the forecast?
- (7) A That's right about 50 percent larger than they had
- (8) expected
- (9) Q And what conclusions generally do you draw then by
- (10) looking at the percent by which ADF&G missed the forecast?
- (11) A Well it says that we're in a highly variable business of
- (12) trying to forecast runs and some years we're close and some
- (13) years we're extremely off and it's a normal kind of a thing
- (14) Fishermen should never expect the agencies to be that
- (15) accurate
- (16) but it gives them a kind of a ballpark figure to gear up with
- (17) their nets whatever else they might need to anticipate what
- (18) their costs are going to be for the next run
- (19) They were actually pretty good in 1992 They were - I
- (20) believe it was 1991 they were pretty close to their prediction
- (21) in Prince William Sound In '90 they were - actually 50
- (22) percent more fish came back than they predicted
- (23) Q You're not criticizing the ADF&G people for being lousy
- (24) predictors?
- (25) A No I would not probably do as well
- (26) Q Dr Brannon let me see if we can wrap up here with a few

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- (1) odds and ends here
 (2) First let me find out your - can you tell the - tell the
 (3) Court and the jury your opinion on the question whether there
 (4) was any - whether the oil spill played a substantial role or
 (5) an important role in reductions or any reductions in the size
 (6) of the population of pink salmon at Prince William Sound?
 (7) A In my opinion you know we don't like oil spills we don't
 (8) want oil spills certainly but in my opinion the oil spill in
 (9) Prince William Sound had no measurable impact on the pink
 (10) salmon population
 (11) Q Now I guess you recognize though that you can't always
 (12) measure everything?
 (13) A That's right
 (14) Q Have you thought about whether there's any kind of an
 (15) upward bound on if there were some impact what it might be?
 (16) A Well it's - you're asking me in the face of all my data
 (17) and all my conclusions do I still think there might be some
 (18) level of impact and I would say I cannot say there's no
 (19) impact but I think it would be - it would be a minor one if
 (20) there was or I would have been able to detect it either in
 (21) adult returns or in the various studies we undertook We
 (22) should have seen some level of impact and I didn't see that so
 (23) my estimate in terms of magnitude of impact would probably
 (24) be
 (24) not to exceed that which the last Fish & Game has suggested
 (25) Q Now Fish & Game or Dr Spies are you referring to?

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- (1) A Dr Geiger or Mr Geiger
 (2) Q Mr Geiger did a study for the Trustee Council?
 (3) A That's right and he came up with a level a rather
 (4) uncertain quantity which includes Bue's information which I
 (5) disagree with but it would - it was still not a great number
 (6) so I mean -
 (7) Q Do you remember approximately what those numbers were?
 (8) A I think it was something around 1.8 million fish on the
 (9) year of the spill thereabouts and so I would say certainly
 (10) the impact would not be greater than that My estimate of
 (11) magnitude would be from zero to his estimate
 (12) Q And as I recall he had 70,000 fish or so in the - or
 (13) maybe a hundred thousand fish in the following two years after
 (14) that 1.8 million estimates?
 (15) A Yes
 (16) Q You know who Dr Spies is?
 (17) A Yes I do He was the senior scientist overseeing the
 (18) Trustees program
 (19) MR COOPER Could we have Exhibit 5983? I believe
 (20) it's 5983
 (21) THE COURT While we're on that did you mean to offer
 (22) 9360?
 (23) MR COOPER Yes Your Honor I did
 (24) (Exhibit 9360 offered)
 (25) MR JAMIN No objection

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- (1) THE COURT There being no objection to Defendants
 (2) Exhibit 9360 it is admitted
 (3) (Exhibit 9360 received)
 (4) BY MR COOPER
 (5) Q Has Dr Spies - well we've already heard some testimony
 (6) concerning the Trustee Council fifth anniversary of the spill
 (7) brochure You've looked at that?
 (8) A Yes I have
 (9) Q And do you recall that there was an estimate in there by
 (10) Dr Spies as to the total number of missing fish or percentage
 (11) of missing fish pink salmon -
 (12) A Yes
 (13) Q - as a result of the spill?
 (14) A I remember that
 (15) Q And do you recall what that number was?
 (16) A Dr Spies suggested that about 10 percent of the population
 (17) coming back into Prince William Sound would be impacted
 (18) including the effect of the oil but including all the other
 (19) environmental factors that might be associated with a low pink
 (20) run And so 10 percent would certainly be within the range of
 (21) just population density and so potential population density
 (22) effects or temperature effects or food effects so I would say
 (23) the 10 percent level is within the normal range of variability
 (24) and I couldn't disagree with that including all the
 (25) environmental factors

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- (1) Q Does that number also sound to you like if you had to put
 (2) an upper bound on what damage the spill may have caused to
 (3) Prince William Sound pinks that that would be an upper
 (4) bound?
 (5) A Well no We're dealing just with the oil absolutely that
 (6) would be my upper bound I'd say somewhere between zero
 (7) and
 (8) that would be my estimate
 (9) Q Finally I think we asked you to - we had - parties had
 (10) promised the jury that we would give them some charts that
 (11) they
 (12) could relate to the verdict form ultimately and we've asked
 (13) you to prepare something along those lines with respect to the
 (14) Prince William Sound lost pink harvest if we can call it that
 (15) for 1990 through '95 You've done something on that?
 (16) A Yes
 (17) Q If we could have Exhibit 8980 A
 (18) Now let's see maybe we can just walk through this
 (19) quickly You have indicated here in this column entitled
 (20) plaintiffs slash Mundy your understanding of what the
 (21) plaintiffs are claiming with respect to fish that - pink
 (22) salmon they were unable to harvest on account of the spill?
 (23) A Yes that's correct
 (24) Q And then in the next column ADF&G and Trustees what is
 (25) that number or the numbers you have there represent?
 (26) A That would represent what the Trustees had arrived at
 (27) based on Geiger's initial estimate and that -
 (28) Q This is by year we're doing this?

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- (1) A Yes that s correct And the red line shows the magnitude
 (2) Q Then you have a column entitled Exxon slash Brannon and
 (3) can you tell us what -
 (4) A It s a little bit confusing there You ve got a zero and a
 (5) slash which means zero to that number and what I m saying is
 (6) that my estimate would be less than that of the Alaska Fish &
 (7) Game and Mr Spies but I - because I can t say for certain
 (8) that there was no impact even though it might be minor I -
 (9) my estimate is someplace between zero and their number
 (10) Q And then with respect to 1991 and 92 and so forth it just
 (11) continues the same calculation?
 (12) A That continues the same calculation using Mr Spies - or
 (13) Dr Spies estimates in the latter part of the columns there
 (14) MR COOPER Your Honor I would move to admit this
 (15) exhibit 8980 A
 (16) (Exhibit 8980 A offered)
 (17) MR JAMIN No objection Your Honor
 (18) THE COURT Defendants 8980 A is admitted
 (19) (Exhibit 8980 A received)
 (20) MR COOPER Thank you Dr Brannon I have no further
 (21) questions at this time
 (22) THE COURT You may cross examine
 (23) CROSS EXAMINATION OF DR ERNEST BRANNON
 (24) BY MR JAMIN
 (25) Q Now sir by your right shoulder there there s two

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- (1) folders
 (2) A Okay
 (3) Q And one of them has some exhibits that we re going to refer
 (4) to and I m going to put them in a pile for you
 (5) A Okay Thank you
 (6) Q And next to that is your deposition all right?
 (7) A Yes
 (8) Q Now u ve spent over three hours on the witness stand and
 (9) I m going to be happy to tell you that you re not going to be
 (10) on that long again for cross okay?
 (11) A Okay
 (12) Q But I want to start and maybe we could get DX1968 A up
 (13) one of the exhibits you just talked with us about a little bit
 (14) before And as I understand it sir what you were saying is
 (15) that you were very interested in the zooplankton levels and how
 (16) that might have affected the fish in 92 and 93 is that
 (17) right?
 (18) A Yes
 (19) Q And that s because at least as I understand it the
 (20) zooplankton is what those fish are eating isn t it?
 (21) A Yes
 (22) Q And so it s important for us to look at what the fish are
 (23) eating as one of the critical factors of their survival?
 (24) A Certainly quantity available yes
 (25) Q And quality too? I mean if they re eating something

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- (1) that s toxic that s not good is it?
 (2) A No
 (3) Q All right We re going to come back to that sir I want
 (4) to spend a little bit of time though talking about that video
 (5) that Mr Cooper went through with you And it was that video
 (6) where the NOAA HAZMAT data was displayed Remember how
 the oil
 (7) was moving out?
 (8) A Right
 (9) Q And rather than play it I thought I d just show a couple
 (10) of stills that were exhibits There was - there was the one
 (11) still from March 28th which showed the - the oil in the Naked
 (12) Island area and working its way down Knight Island and so
 (13) forth?
 (14) A Yes
 (15) Q And then we saw later on that that oil by March 30th had
 (16) worked its way a little bit farther down and it s sneaking out
 (17) here in the channel out of Prince William Sound isn t it?
 (18) A Right
 (19) Q All right And then farther on down on April 7 even more
 (20) of it s out right?
 (21) A (No response)
 (22) Q It s gotten past Elrington Island and moving towards the
 (23) Kenai Peninsula?
 (24) A Yes
 (25) Q You were making two points the first of which was when the

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- (1) fish that were returning to spawn in 1989 came back there
 (2) wasn t much oil because that HAZMAT showed it s heading out
 (3) right?
 (4) A The adults yes
 (5) Q And the other point you were making was that the fish that
 (6) were leaving the Sound in 89 the little guys that had been
 (7) lain in the fall of 88 when they left there wasn t much oil?
 (8) A That s right
 (9) Q Now that HAZMAT whether it s in the video form or the
 (10) individual slides we ve just looked at it doesn t tell the
 (11) whole story about the oil does it?
 (12) A Certainly not
 (13) Q And roughly 40 percent of the oil or about 4 million
 (14) gallons was in the area these fish were going through?
 (15) A As juveniles?
 (16) Q Yes sir
 (17) A Okay I m not aware of that but -
 (18) Q All right Well Mr Jahns told us about that and we ll
 (19) stand by that but for those fish on their way out in this
 (20) nearshore period the movement of fish occur in a general
 (21) downstream pattern with the current through Prince William
 (22) Sound is that correct sir?
 (23) A That is correct
 (24) Q All right And the oil that was on the beaches you re
 (25) aware that some of that oil was rereleasing into the

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- 1: environment and restrandng on other beaches aren t you?
- 2: A Yes I am
- 3: Q And the bays and estuaries in the southwestern portion of
- 4: Prince William Sound - this area down here?
- 5: A Yes
- 6: Q Those bays and estuaries they are the nursery areas for
- 7: pink salmon fry immediately after emergence from their natal
- 8: streams?
- 9: A Definitely
- 10: Q All right And the fry emerge from gravel in the spring
- 11: between April and June and immediately move into this
- 12: nearshore habitat?
- 13: A Yes
- 14: Q And the juveniles feed in the nearshore areas for a few
- 15: weeks before moving out through this channel into the Gulf of
- 16: Alaska?
- 17: A The nearshore area defined as the area right next to shore
- 18: or -
- 19: Q I m using your words as you know - and why don t you tell
- 20: me what the nearshore area is?
- 21: A The nearshore area would be as close or as far as several
- 22: miles from the actual beach line but it s nearshore because
- 23: it s within Prince William Sound
- 24: Q All right And it s in this area down here?
- 25: A Yes sir

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- (1) (Videotape Concluded)
- (2) BY MR JAMIN
- (3) Q That portion that I was pointing out to you that s an
- (4) example of the habitat is it not where these young pink
- (5) salmon come out and eat?
- (6) A You re referring to which of the two pictures that the -
- (7) the overview where the seagulls are in the water?
- (8) Q Not with the seagulls Before when I was specifically
- (9) pointing that s an example of that nearshore habitat isn t
- (10) it?
- (11) A It s really a very minor part of it
- (12) Q But it is an example of it sir?
- (13) A Certainly that example that part next to beach yes
- (14) Q Let me ask you did you actually go to Prince William Sound
- (15) at all? Did you go there at all before September of 1989?
- (16) A Yes September - no No sir I didn t
- (17) Q September was the first you were out there?
- (18) A Right
- (19) Q All right You didn t have a chance to do any work
- (20) yourself involved in any fieldwork yourself or any visual
- (21) observations of that oil as it was leaving Prince William Sound
- (22) and affecting these fish as they were - they were leaving and
- (23) the other fish as they were coming in before September of 1989
- (24) did you?
- (25) A I didn t observe anything in Prince William Sound before

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- (1) Q All right
- (2) A Well that s the exit out right
- (3) Q But that s how the fish go out of the Sound isn t it sir?
- (4) A Yes that s correct
- (5) Q There may be a couple that head out over here by Cordova
- (6) but the general -
- (7) A General -
- (8) Q - Trend is out this way?
- (9) A That s right
- (10) Q And that general trend is for the hatchery fish that come
- (11) from these areas up here too isn t it?
- (12) A Yes it is
- (13) Q Now sir did you get a chance to look at Mr Rosenthal s
- (14) video the one where - the herring spawn video?
- (15) A No I didn t
- (16) MR JAMIN Let s just take a quick look at the first
- (17) portion of that There s another portion where there s a guy
- (18) wiping oil but I don t want to look at that Let s look at
- (19) the beginning This is 247 A
- (20) (Videotape Played)
- (21) BY MR JAMIN
- (22) Q These are herring aren t they?
- (23) This is what I want you to look at sir and I want to ask
- (24) you a question about it in just a little while
- (25) All right That s enough

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- (1) that date
- (2) Q All right Let s take a look at some of the fieldwork that
- (3) you actually did sir and some of the work that was not done
- (4) as well In 89 Exxon used another contractor to gather data
- (5) pertaining to nearshore survival of juvenile pinks in Prince
- (6) William Sound is that correct?
- (7) A Yes that s correct
- (8) Q And that was Pentec?
- (9) A Yes it was
- (10) Q And in your deposition you acknowledge that you did not
- (11) review any of the data gathered in 1989 pertaining to nearshore
- (12) survival of pinks in Prince William Sound is that correct?
- (13) A That would be a mistake I didn t review it as it came
- (14) back but certainly I have reviewed it in my analysis of
- (15) effects in Prince William Sound
- (16) Q So would you agree with me when you gave your deposition
- (17) you hadn t reviewed it?
- (18) A I would say that would be incorrect yes
- (19) Q Let s just take a look at your deposition and see whether
- (20) that s what you told us at that time Could you go to page 53
- (21) sir?
- (22) A That s the first one?
- (23) Q Yeah it s the first one but I m not sure it s the first
- (24) one you re going to take out Let me help you a little bit
- (25) here That s volume three and that - the page is going to be

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- (1) in volume one This is two - you see those Roman numerals on
 (2) the front and this is one volume - page 53 will be in volume
 (3) one sir
 (4) A Okay I guess I don't see the Roman numeral Is that up
 (5) on the corner?
 (6) Q Should be in the middle of the page
 (7) All right This is - let's go right to the page numbers
 (8) which are up in the right hand corner
 (9) A Okay
 (10) Q And we'll go to page 53 sir and do you see on lines 12 to
 (11) 15 you see it and was this question given sir?
 (12) A I'm sure it was yes
 (13) Q Did you review data gathered in 1989 pertaining to
 (14) nearshore survival of juvenile pink salmon in Prince William
 (15) Sound and you said no?
 (16) A That's correct
 (17) Q All right Now you told us at the same time did you not
 (18) that it was your preference in doing your research regarding
 (19) pink salmon condition in Prince William Sound following the oil
 (20) spill to look at offshore data rather than nearshore data is
 (21) that correct?
 (22) A Yes
 (23) Q And you did not analyze any of the 1989 data that looked at
 (24) the specific effects of the oil on samples that were taken in
 (25) 1989 did you?

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- (1) A That's nearshore
 (2) Q That's correct sir?
 (3) A That's correct yes
 (4) Q All right Now there's been a lot of talk about genetic
 (5) damage in this courtroom and we're going to come back to that
 (6) later this morning but first am I right that there was some
 (7) work that you started to do on - for Exxon on genetic effects
 (8) on pink salmon from exposure to crude oil?
 (9) A Yes
 (10) Q All right And that - that work on the assessment of
 (11) potential genetic effects on pink salmon from exposure to crude
 (12) oil was terminated?
 (13) A Oh yes right
 (14) Q All right and when you were deposed you said you were not
 (15) aware of any other efforts by anybody else within Exxon or
 (16) affiliated within Exxon to replicate or redo the work that you
 (17) began on this paper is that correct?
 (18) A Right
 (19) Q And in fact it would have been your recommendation that
 (20) you should have been allowed to go ahead and do that genetic
 (21) research is that correct?
 (22) A I - I don't recall exactly but I would have liked to have
 (23) done it yes
 (24) Q All right and it's your point of view that the research
 (25) you began regarding the assessment of potential genetic
 effects

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- (1) on pink salmon should be pursued is that correct?
 (2) A Yes
 (3) Q All right Now I want to talk just a bit about
 (4) bioaccumulation That's where an animal is accumulating
 (5) something in their body is that right?
 (6) A That's right
 (7) Q And in your deposition you stated that it was considered
 (8) unlikely that long term effects from bioaccumulation would
 (9) occur?
 (10) A Yes
 (11) Q And in your deposition you said in terms of what you
 (12) designed for Exxon you did not do anything to determine
 (13) whether there were long term effects from bioaccumulation?
 (14) A That's right
 (15) Q Just wasn't done?
 (16) A I didn't do that yes
 (17) Q And you don't know whether anybody or any group outside
 of
 (18) Exxon attempted to study the long term effects from
 (19) bioaccumulation do you?
 (20) A Well I'm aware of NOAA's studies yes
 (21) Q Nobody in Exxon did it?
 (22) A No Well I'm not aware of anything but I think I would
 (23) have been aware if they'd done it but I can't say
 (24) Q Because you were responsible for this area weren't you?
 (25) A That's right yes

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- (1) Q And you would have been aware of it?
 (2) A Well Exxon often would only allow me to know what I
 needed
 (3) to know so if they were doing something else I couldn't say
 (4) for sure
 (5) Q I understand sir You haven't done any work in this pink
 (6) salmon area involving straying on the Exxon Valdez oil spill
 (7) situation have you?
 (8) A No sir
 (9) Q And straying is where the fish that normally would go back
 (10) to one stream go to another stream?
 (11) A That's right
 (12) Q And that when they do that that's a chance that - that if
 (13) an animal was genetically damaged it might be able to pass it
 (14) into another stream's stock?
 (15) A That's right
 (16) Q Now I'm going to ask you sir if you're willing to agree
 (17) with the following statements Organic contaminants absorbed
 (18) into natural sediments can be bioaccumulated to a limited
 (19) extent and enter the marine food web?
 (20) A Bioaccumulated in the sediments?
 (21) Q Yes sir
 (22) A Yes
 (23) Q And marine microalgae like plankton rapidly accumulates
 (24) PAH - that's those polycyclic aromatic hydrocarbons right?
 (25) A Yes

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- (1) Q - to high concentrations during exposure to low
 (2) concentrations of PAH in the ambient water?
 (3) A I don t know that sir
 (4) Q Well let me ask you do you - do you rely on Dr Neff for
 (5) this kind of information?
 (6) A I do
 (7) Q And if he told you this you d believe it?
 (8) A I would
 (9) Q Let me get Dr Neff s deposition if I may and we ll come
 (10) back to that
 (11) Would you agree with me that all of the food items
 (12) copepods amphipods zooplankton tend to accumulate
 (13) hydrocarbons to which they re exposed?
 (14) A I would think they would tend to accumulate them yes
 (15) Q Those are some of those little critters that the pink
 (16) salmon eat when they re coming back in right?
 (17) A That s right
 (18) Q In fact pink salmon when they re coming back in they re
 (19) fairly voracious animals aren t they? They eat almost
 (20) everything they see?
 (21) A As adults?
 (22) Q Yes sir
 (23) A They really stop - they start stopping to feed when they
 (24) come back in
 (25) Q But before they stop feeding they ll eat pretty much

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- (1) anything in sight?
 (2) A To grow fast they must eat a lot yes
 (3) Q All right and the - would you agree with me that early
 (4) growth rate of salmon can affect survival?
 (5) A Yes sir
 (6) Q In fact that s a very significant factor in terms of
 (7) survival is it not?
 (8) A I believe it is yes In terms of a - within the group of
 (9) fish the smaller ones are more vulnerable than the larger
 (10) ones
 (11) Q And would you agree with this statement sir that a great
 (12) many species of organisms live on or just below the surface of
 (13) the ocean?
 (14) A Yes
 (15) Q Is that that neustonic level layer that we talked about a
 (16) little bit?
 (17) A I think it would include the whole of the ocean depth
 (18) Q All right but I wanted to see whether you agree with me on
 (19) a very specific statement - A great many species of organisms
 (20) live on or just below the surface of the ocean on or just
 (21) below?
 (22) A Yeah I would think that would be true
 (23) Q And the neuston are bacteria plants and animals that spend
 (24) all or part of their life cycles associated with the water
 (25) surface?

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- (1) A Yes
 (2) Q And included among the neuston are the eggs and larvae of
 (3) several species of fish and invertebrates that spend the
 (4) remainder of their lives deep in the water column or on the
 (5) bottom of the sea?
 (6) A I would think that s true yes
 (7) Q You d agree with that?
 (8) A Well I don t know from personal knowledge I m sorry but
 (9) I think that s most likely true
 (10) Q So if Mr Neff said that you d agree with him?
 (11) A I would highly suspect it as being true
 (12) Q All right Now let s take a look at some of this water
 (13) quality work we ve talked about This is an area where you -
 (14) I think I d like to get - maybe Mr Cooper could get me 5720 A
 (15) and the color copy Could we bring up 5720 A? Let s do that
 (16) We weren t blessed with a color copy But now we have one
 (17) Now in part you relied on the work that Mr Neff told us
 (18) about?
 (19) A Yes I did
 (20) Q And this is an important part of the basis for your
 (21) conclusions?
 (22) A I think so yes
 (23) Q And part of the point of this - this diagram at the top is
 (24) that -
 (25) A Could you move that - that -

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- (1) Q Sir I would be happy to
 (2) A - flip chart and I can see what I m looking at
 (3) Q Because I want you to look at this And part of the point
 (4) is that there s just - I mean you have eight over ten parts
 (5) per billion and 840 below you ve only got one percent above
 (6) this line that was part of the point right?
 (7) A I heard Mr Neff say that yes
 (8) Q That s part of what you relied on?
 (9) A Yes
 (10) Q And the same thing down here for these VOAs but I m also
 (11) interested in them We just don t see much according to you
 (12) and Mr Neff above this line?
 (13) A Yes
 (14) Q So we don t have much to worry about is that right?
 (15) A That s right
 (16) Q Now were you here for Mr Neff s testimony?
 (17) A Not all of it sir
 (18) Q All right Is it your understanding that Mr Neff sampled
 (19) water at different layers of the ocean?
 (20) A Yes
 (21) Q And one of those - like one was down a meter one was down
 (22) three meters and some down nine meters stuff like that?
 (23) A Yes
 (24) Q Sir do you know that these data points are blends or
 (25) averages of that data?

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- (1) A I would suspect it would be
 (2) Q You would suspect it would be? So from these data points
 (3) we can't tell what the PAH is right at the top or a little ways
 (4) down or farther down because they're averaged right?
 (5) A I can't say for certain how much an average they are
 (6) Q But if they are averaged -
 (7) A Okay
 (8) Q - then you really can't distinguish what the PAH level is
 (9) at the top in the middle or farther down can you?
 (10) A That's right
 (11) Q That averaging takes it out is that right?
 (12) A That's right
 (13) Q It takes out some of the detail?
 (14) A It takes out some of the variability
 (15) Q All right Now you're familiar are you not with some
 (16) work done by Messrs Rice Short and Heintz (ph) on the
 (17) exposure of salmon to oiled incubation substrate?
 (18) A Yes I am
 (19) Q I got something out there we better define The substrate
 (20) is the stuff they're incubating in like the gravel right?
 (21) A That's right
 (22) Q And incubation means they're down there and they're - the
 (23) eggs are down there and they're going to come out of there?
 (24) A In the gravel in the streams right
 (25) Q So they looked at that area down there specifically where

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- (1) the salmon eggs are?
 (2) A Yes
 (3) Q All right And you're aware that they - they did some
 (4) fairly careful analysis as to the amount of oil in that
 (5) substrate and then the amount of oil that was directly near or
 (6) adjacent to the substrate at what time they called the
 (7) effluent from the substrate is that correct?
 (8) A Yes
 (9) Q Now Mr Rice one of those three authors is the man -
 (10) and I don't know whether you were here when Mr Neff told us
 (11) this but you tell me whether you were or not He's the man
 (12) Mr Neff said was the expert on toxic effects of oil on Alaska
 (13) species were you here for that?
 (14) A I was not But I would agree he's well informed about
 (15) that at least with salmon
 (16) Q You independently agree with Mr Neff on that then?
 (17) A Yes
 (18) Q All right And Mr Neff had in fact relied some on some
 (19) work from Mr Rice when he talked about this Were you here
 (20) for that?
 (21) A I know he was referring to it
 (22) Q All right There's an exhibit there sir that we're going
 (23) to talk about very specifically It's 3554 and I think it's
 (24) just a couple down Right there it is sir all right?
 (25) A Uh huh

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- (1) Q Now that's the report by Mr Rice and Mr Short and
 (2) Mr Heintz and we've talked about it a little bit so far is
 (3) that right?
 (4) A Yes
 (5) Q And they were considering in that report a hypothesis of
 (6) a Mr Sharr from ADF&G that pink salmon embryos the eggs
 and
 (7) larvae incubated in oiled substrates - that's that gravel?
 (8) A Yes
 (9) Q May have experienced genetic damage resulting in
 functional
 (10) sterility is that right?
 (11) A That's correct
 (12) Q Now what they did is they put some of the pink salmon eggs
 (13) into the sediments and the sediments that they - that they put
 (14) them in had different levels of oiling is that correct?
 (15) A That's right
 (16) Q And then they looked at the fry that came out?
 (17) A Yes
 (18) Q All right and they keep track of the fry and whether or
 (19) not the fry display lesions and if they do they count the
 (20) lesions is that correct?
 (21) A Yes
 (22) Q And they found that common lesions included clubbed
 caudal
 (23) fins shortened opercula edema scoliosis and abnormal eye
 (24) development didn't they?
 (25) A Yes

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- (1) Q You're going to have to help me out again I think maybe
 (2) all of us What's the caudal fin?
 (3) A That's the tail
 (4) Q The tail all right and is a clubbed caudal fin
 (5) significant for a pink salmon sir?
 (6) A I think it would be
 (7) Q What does it mean?
 (8) A It means the fin wouldn't form properly and they wouldn't
 (9) be able to fan the water or swim quite as well
 (10) Q And I hope I got this right it is the opercula?
 (11) A Opercula That would be the gill covers
 (12) Q What does it mean a shortened opercula?
 (13) A Means that the edge of the gill cover is showing a little
 (14) bit of a gill
 (15) Q Okay So there's like a part of the fish that covers the
 (16) gill?
 (17) A Right
 (18) Q Is that like the equivalent of skin and muscle covering the
 (19) gill?
 (20) A No it would be like a sleeve on your arm
 (21) Q All right So part of that is pulled back then or it just
 (22) isn't there?
 (23) A That's right
 (24) Q Is that of any significance for the fish?
 (25) A Well we don't know Certainly the fish normally has it

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- (1) covered so you'd think that would be the best situation but
 (2) where we've seen it shortened we haven't seen any differences
 (3) in survival They come back sometime with shorter opercula
 (4) Q Now how about edema?
 (5) A Swelling that's fluid buildup
 (6) Q Is that significant for the fish?
 (7) A Well if it's extensive I would think it would be yes
 (8) Q Why would it be sir?
 (9) A Would reduce their ability to exercise probably listless
 (10) not able to respond readily to predators so forth
 (11) Q All right Now how about - what's scoliosis?
 (12) A That's where you've got a bent spine
 (13) Q Okay and so instead of being sort of straight the fish is
 (14) bent a little bit?
 (15) A That's right
 (16) Q Does that affect survival? Is that important for this
 (17) fish?
 (18) A I see very few come back that have a bent spine
 (19) Occasionally but not very many
 (20) Q When you say come back you mean they die?
 (21) A They come back as adults with a bent spine You see it in
 (22) streams and you see it in hatcheries but I think that would be
 (23) a survival disadvantage
 (24) Q All right Now I got to translate this to something I can
 (25) understand When you say survival disadvantage you mean they

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- (1) probably die don't you?
 (2) A They'd be eaten yeah
 (3) Q All right And Mr Rice and his co authors report results
 (4) for the 1990 brood year don't they?
 (5) A Yes they do
 (6) Q And they report that pink salmon embryos incubating in
 (7) gravel contaminated with oil experience poor survival
 (8) increased energetic demands and impaired osmo regulation
 (9) don't
 (10) they?
 (11) A Yes
 (12) Q What does increased energetic demands mean sir?
 (13) A Means that they're putting more energies into some other
 (14) activity other than growth
 (15) Q And so that would lead to them being smaller than they
 (16) would otherwise be?
 (17) A Yes
 (18) Q And that's one of the factors that leads to survival that
 (19) we talked about before? -
 (20) A That's correct
 (21) Q What's the osmo regulation part?
 (22) A That's their ability to maintain their water balance in the
 (23) presence of saltwater which is going to tend to draw salt out
 (24) of them or fresh water out of them
 (25) Q So their skin is like sort of a membrane and there's a
 balance between the saltwater and the internal?

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- (1) A It's probably the gills but that's true
 (2) Q And the gills too all right And is that something that
 (3) might affect survival sir?
 (4) A Well it - if they can't get their ability to balance
 (5) their salt levels in saltwater if it's a temporary thing
 (6) that's one thing If it's a long term thing I would think
 (7) that would affect the survival yes
 (8) Q Now do the gentlemen report that survival from
 (9) fertilization to emergence was inversely related to dose?
 (10) A Yes I was thinking of mortality but yes inverse -
 (11) Q And this inverse relationship that means that the higher
 (12) the dose or the more the dose of oil in the substrate the less
 (13) the survival?
 (14) A If you look at their data they only had one point where
 (15) survival was markedly reduced
 (16) Q Well let me ask you do they report embryos incubating in
 (17) the 1.5 and 5.7 grams per kilogram doses - and that's the oil
 (18) in the substrate right?
 (19) A Right
 (20) Q Demonstrated early emergency timing small size at
 (21) emergence reduced glycogen stores suggesting relationship
 (22) between dose and energy demand?
 (23) A Yes
 (24) Q And do they report that proportionately more embryos from
 (25) those doses displayed edema indicating impaired osmo

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- (1) regulation?
 (2) A I believe they did
 (3) Q Now they measured this water or this effluent that's
 (4) coming out of the gravel right near the sediments didn't they?
 (5) A Yes they did
 (6) Q And it was about 50 parts per billion right by the
 (7) sediment?
 (8) A From the high dose
 (9) Q Yes sir
 (10) A No that was the effluent coming through the columns yes
 (11) Q All right and did they say that these results suggest that
 (12) the state standard for water quality may be too high?
 (13) A They incorrectly state that
 (14) Q Well they do state it though sir?
 (15) A Yes they do state that
 (16) Q It's your view that they're incorrect?
 (17) A Yes
 (18) Q But they say that?
 (19) A Right
 (20) Q They're not working for the plaintiffs here are they?
 (21) A No
 (22) Q Do they also say sir that at the 50 parts per billion
 (23) rate mortality was higher than 96 percent?
 (24) A I would - I would have to check that I know it's -
 (25) Q Would you go ahead and do it? Because I know you spent

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- (1) some time looking at this and I want to have this right
 (2) A Yes in excess of 90 percent right
 (3) Q 96?
 (4) A Well at least it could be high but I don't see the place
 (5) for 96 but -
 (6) Q I'll take your at least 90 for now We won't quibble on
 (7) that Now do you know something about how standards are
 set
 (8) in the toxicological business sir?
 (9) A I'm aware that they set them to make sure they're below
 (10) potential effects yes
 (11) Q And they often set them at an order of magnitude or two
 (12) orders of magnitude below where we find significant death is
 (13) that right?
 (14) A That's right
 (15) Q Now an order of magnitude that's like that thing where we
 (16) Alaskans know about for earthquakes that's like that Richter
 (17) scale where you go up one and it's really one order of
 (18) magnitude is ten fold?
 (19) A Right
 (20) Q And I think we talked about this is little bit with
 (21) Mr Neff yesterday If you've got this lethal dose at 50
 (22) percent or lethal dose at 90 percent you drop down a couple of
 (23) order of magnitudes below that for safe levels don't you?
 (24) A Right
 (25) Q So if we were at 50 parts per billion and we were

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- (1) generating 96 percent death then we'd go down one order of
 (2) magnitude and it would be 5 parts per billion is that right?
 (3) A We're talking about the water column not the substrate
 (4) oiling?
 (5) Q We're talking about water column now
 (6) A Yeah
 (7) Q And if we go down two orders of magnitude we'd be down
 (8) to 5 parts per billion is that right?
 (9) A I suspect it is but I -
 (10) Q I want to be sure about my math here
 (11) A I probably need a calculator but I think I'm following
 (12) your rationale
 (13) Q All right Now were you here when Dr Neff said that fish
 (14) could spend a significant portion of their lives in 10 parts
 (15) per billion without a problem?
 (16) A I was yes
 (17) Q Now let me go on to another study sir Let me - one
 (18) more question there When Mr Neff said that he was relying
 (19) on some work that Mr Rice had done many many years ago is
 (20) that not right?
 (21) A Yes sir
 (22) Q And that was before Mr Rice studied the effects of the
 (23) Exxon Valdez oil spill and generated this whole area of
 (24) research is that correct?
 (25) A His most recent research that was - that was before his

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- (1) most recent research yes
 (2) Q That recent research is what we've just been talking about
 (3) isn't it?
 (4) A That's right
 (5) Q Now you can put that one to the side sir
 (6) Are you familiar with Mr Bue's recent work in this area
 (7) and it's reflected in a letter that he wrote to the
 (8) commissioner of the Alaska Department of Fish and Game in
 (9) December of 1993?
 (10) A Could I see the letter please?
 (11) Q Yes sir it's up there and it's in front of you and it's
 (12) Plaintiffs Number 868 Are you finding it sir?
 (13) A I will in a minute I'm sure
 (14) Q I tell you what rather than spend a lot of time let me
 (15) let you look at my copy and see if you remember it This is
 (16) the one we're going to talk about okay?
 (17) A Okay thank you
 (18) Q Now let me just give you a second to become familiar again
 (19) with it so you know what we're talking about
 (20) A Okay
 (21) Q Is that work that you are familiar with?
 (22) A I've seen part of this yes
 (23) Q Okay Have you looked at it carefully sir?
 (24) A Yes
 (25) Q All right And you know that Mr Bue has concluded that

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- (1) there's an inheritable difference in egg mortality for fish
 (2) from oiled versus unoiled streams don't you?
 (3) A Yes
 (4) Q And that inheritable when Mr Bue uses it that way that
 (5) means genetic right?
 (6) A I think so yes
 (7) Q Now Mr Bue isn't working for the plaintiffs is he sir?
 (8) A No
 (9) Q Now I want to look at some of the research that was out
 (10) there prior to the time you decided to do your analysis for
 (11) Exxon here And let's start with - actually some of it
 (12) was - was after you started with Exxon You had a - a peer
 (13) reviewed paper in which you were a co author that was entitled
 (14) The Influence of Crude Oil and dispersant on the Sensory
 (15) Characteristics of steelhead in Marine Waters didn't you?
 (16) A That's right
 (17) Q And that was with a series of co authors?
 (18) A Yes
 (19) Q Steelhead is that a fish that's in the salmonid family?
 (20) A That's right
 (21) Q And you and your co authors in that report state do you
 (22) not sir that the tanker transport of oil along the Pacific
 (23) coast of North America can result in serious oil spills that
 (24) have significant implications to the fishing industry?
 (25) A Yes I did

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- (1) Q And you recognize in that report that fish can absorb
 (2) hydrocarbons?
 (3) A Yes
 (4) Q And you say oil tainting or absorption from hydrocarbons
 (5) from oil to the edible portion of fish would have serious
 (6) implications on the marketability of fish and fish products in
 (7) general don t you?
 (8) A That s right
 (9) Q And you also determine that just sniffing raw or cooked
 (10) fish may not detect that contamination has occurred?
 (11) A That s right
 (12) Q And you said cooked fish placed in the mouth may increase
 (13) the testing of oil contaminant?
 (14) A Yes
 (15) Q And the changes in flavor perception or low levels of off
 (16) flavor can have profound implications on market quality?
 (17) A Yes
 (18) Q Now you re also aware of a work by Mr - that same
 (19) Mr Rice Stan rice is that his name?
 (20) A Yes
 (21) Q They call him Jeep though don t they?
 (22) A Okay
 (23) Q Do you know that?
 (24) A I m not sure if I ve heard him called that
 (25) Q Have you met Mr Rice?

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- (1) A I ve met him but only quite some time ago
 (2) Q All right You re familiar with a 1993 paper where
 (3) Mr Rice says that several studies document that crude oil and
 (4) its components inhibit growth of fish aren t you?
 (5) A Yes
 (6) Q And the authors say that if exposure to oil inhibits the
 (7) growth of pink salmon these fish would be more susceptible to
 (8) predation and that means more likely to being eaten?
 (9) A Yes
 (10) Q And possibly more susceptible to disease and might
 compete
 (11) less successfully for food than unexposed fish aren t you?
 (12) A Yes
 (13) Q And the authors state that even low levels of oil pollution
 (14) could reduce survival of pink salmon during their early marine
 (15) life?
 (16) A Yes
 (17) Q And in fact the authors concluded that fish exposed for 40
 (18) days to sublethal that means less than enough to kill right?
 (19) A Yes
 (20) Q Concentrations of naphthylene in the water soluble fraction
 (21) of Cook Inlet crude that s what they were looking at in that
 (22) study?
 (23) A Yes
 (24) Q Those fish grew significantly less than unexposed fish?
 (25) A That s correct

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- (1) Q Let s take a look at some of the work the Trustees have
 (2) done in the area One of the Trustee papers by Wortheimer
 (3) found a significant loss in adult returns in 1990 because oil
 (4) in those marine feeding areas bays and estuaries caused
 (5) poorer growth of pink juveniles which would result in higher
 (6) losses you re familiar with that aren t you sir?
 (7) A I m familiar with it yes
 (8) Q All right Now Mr Willette -
 (9) A He didn t state that however
 (10) Q I m sorry?
 (11) A He didn t state that however That he found reduced adult
 (12) return He speculated that what he was measuring caused an
 (13) adult return loss but he didn t state that he found that
 (14) Q So that this was what he found from a review of others
 (15) work is what you re saying?
 (16) A No he was reviewing his data and others work in terms of
 (17) the growth in the marine environment and found a difference in
 (18) their size that he correlated or he said was related to oil and
 (19) then he said that could cause an adult return loss
 (20) Q I ll take it sir Now you re familiar as well with Mr
 (21) Willette s work?
 (22) A Yes I am
 (23) Q And that he has concluded that the number of adult pink
 (24) salmon that return each year appears to be strongly affected by
 (25) mortality during the early marine period?

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- (1) A Yes
 (2) Q And that early marine period that s when those fish are
 (3) out there in this environment and they re - some of them are
 (4) in this nearshore environment?
 (5) A Yes
 (6) Q And that s where they re mixed with those that kelp and
 (7) eelgrass and fucus they re in that environment?
 (8) A No they re really on the surface some distance from that
 (9) Q They re on the surface?
 (10) A The top three to four feet of water usually
 (11) Q All right Is it - is it your position that the juvenile
 (12) salmon don t live in the - in the vegetable environment the
 (13) kelp and the eelgrass and the -
 (14) A You can certainly find them there at times but in terms of
 (15) the greatest percentage of their time like 99 percent of the
 (16) time they are in free swimming environments away from
 (17) shoreline
 (18) Q All right And let me ask you whether Mr Willette said
 (19) that slow growing individuals sustain a higher mortality
 (20) because they are vulnerable to predators for a longer time?
 (21) A That s what he says yes
 (22) Q And you agree with that don t you?
 (23) A I do
 (24) Q And that oil contamination can reduce the growth rate of
 (25) juvenile pink salmon in seawater?

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- (1) A He says that yes
- (2) Q Now I'm going to ask you sir about - about whether you
- (3) agree or disagree with some of the results that the Trustees
- (4) came up with
- (5) A Okay
- (6) Q All right? Do you agree with the following in autumn of
- (7) 1989 egg mortality in oiled streams averaged about 15 percent
- (8) compared to about 9 percent in unoiled streams?
- (9) A Based on - I mean just a statement I agree that that
- (10) statement has been given
- (11) Q That the Trustees said that?
- (12) A Yes
- (13) Q Now do you agree that that's what really happened?
- (14) A I believe they found dead eggs when they - when they
- (15) pulled them out of the gravel
- (16) Q Okay is your work consistent with the Trustees in that
- (17) area or inconsistent?
- (18) A We found no embryo mortalities which would be comparable
- (19) to the egg mortalities
- (20) Q All right Are you telling me that your work is consistent
- (21) with what the Trustees found or inconsistent?
- (22) A Inconsistent
- (23) Q Inconsistent all right And would you agree or disagree
- (24) with the following Since 1989 egg mortality in the oiled
- (25) areas has generally increased?

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- (1) A I would disagree with that
- (2) Q Disagree with the Trustees on that?
- (3) A Yes
- (4) Q Do you agree with the following 1991 and 1992
- (5) approximately 40 to 50 percent of the salmon eggs in oiled
- (6) streams did not survive as compared to an 18 to 30 percent
- (7) mortality in unoiled streams?
- (8) A I would disagree with that
- (9) Q Trustees found that though?
- (10) A That's correct
- (11) Q Do you agree with the following In 1993 though the rates
- (12) of egg mortality had dropped to an average of less than 25
- (13) percent in oiled streams and less than 15 percent in unoiled
- (14) streams the difference has still persisted?
- (15) A I have no data that I gathered that would counteract that
- (16) Q But you know that's what the Trustees found?
- (17) A Yes
- (18) Q And do you agree with the following There was a genetic
- (19) effect in the young which carried over into adulthood and was
- (20) even inherited by the next generation?
- (21) A Of course not
- (22) Q You don't agree with that?
- (23) A No
- (24) Q That's what you're here to tell us about today?
- (25) A Yes that's right

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- (1) Q But that's what the Trustees found isn't it?
- (2) A Yes sir
- (3) Q All right And as far as you're concerned that's not even
- (4) a possibility?
- (5) A I - in science everything always has a possibility
- (6) Q All right but to understand what you're telling us here
- (7) today that possibility is right down at the bottom isn't it?
- (8) A All my data pointed to the opposite direction
- (9) Q We'll come back to look at that sir Do you agree with
- (10) the following or disagree Differences in egg mortality
- (11) between pink salmon from the oiled and unoiled streams when
- (12) both were raised in the laboratory were as great as the
- (13) differences seen in the wild essentially eliminating
- (14) environmental factors from consideration
- (15) A They said that yes
- (16) Q The Trustees said that?
- (17) A Yes sir
- (18) Q But you don't agree with that?
- (19) A Well I - I didn't look at their data - I didn't look at
- (20) my data or didn't have any data on that year
- (21) Q And you said you didn't look at their data on that issue
- (22) did you?
- (23) A Well this is what it is here I believe sir
- (24) Q Did you look at it?
- (25) A Yes

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- (1) Q Do you agree or disagree with it? You don't have any data
- (2) yourself in this area Do you agree or disagree with what the
- (3) Trustees said there?
- (4) A I would disagree
- (5) Q Don't need any data to disagree?
- (6) A Well in looking at their data
- (7) Q Would you agree or disagree with the following that
- (8) there's an inheritable difference in egg mortality for fish
- (9) from oiled versus unoiled streams?
- (10) A Is that the same question?
- (11) Q Well it is - you're right It's a question I asked you
- (12) before that Mr Willette had in his report and now the Trustees
- (13) have adopted it Do you agree or disagree with the Trustees
- (14) statement?
- (15) A I would disagree with that
- (16) Q Disagree with it and do you agree or disagree with the
- (17) following Besides the fate of eggs laid in oiled gravel
- (18) juvenile fish emerging into Prince William Sound in the spring
- (19) of 89 encountered oil in the water as slicks or small droplets
- (20) which were consumed along with food?
- (21) A I would not agree - I would not disagree with that
- (22) Q Would not disagree?
- (23) A Yeah
- (24) Q Well does that show on this chart here sir on 5720 A?
- (25) A No sir

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- Q And despite the large size of the 1990 run of pink salmon
 (2) it would have been larger by as much as 1.9 million fish if the
 (3) spill had not occurred say the Trustees agree or disagree
 (4) sir?
 (5) A That's where I said my range - that would be the maximum
 (6) impact perhaps
 (7) Q So you're not agreeing with them on that point but you
 (8) recognize it may be a possibility?
 (9) A Yes
 (10) Q Are you able to quantify that possibility at all for us?
 (11) A No sir
 (12) Q All right Let's look at some of your differences now with
 (13) Dr Mundy You weren't present for his testimony?
 (14) A No I wasn't
 (15) Q But I'm sure you've been told about it?
 (16) A I've been told about segments of it yes
 (17) Q You know that Dr Mundy - first of all you know Dr Mundy
 (18) reached his conclusions before he was hired by the plaintiffs?
 (19) A I'm not -
 (20) Q You weren't told about that part of his testimony?
 (21) A That he was -
 (22) Q That he reached his conclusions before he was hired by the
 (23) plaintiffs?
 (24) A I'm not aware of when he reached his conclusions
 (25) Q All right but you know that or were told that he relied

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- (1) for his conclusions that there was damage to Prince William
 (2) Sound pinks based on studies dealing with damage to herring
 (3) with nearshore intertidal damage with the damage to other
 (4) species like cutthroat trout damage to salmon embryos the
 (5) low survival of herring the low survival of both wild and
 (6) hatchery stocks the effects seen only in Prince William Sound
 (7) on the runs in '92 and '93 and that there was evidence of
 (8) continued damage to the ecosystem and that the forecast
 models
 (9) were shooting high about what he perceived to be an adequate
 (10) estimation you were told about those reasons weren't you?
 (11) A Not all of them but certainly those associated with the
 (12) pink salmon
 (13) Q All right Let me see to what extent you and Dr Mundy
 (14) have some overlap anyway Based on the research you've
 done
 (15) in the case and your knowledge of pink salmon you would
 agree
 (16) at least that the pink salmon returns to Prince William Sound
 (17) in '93 were on the low end of the historical range of returns
 (18) at least through the sixties is that right?
 (19) A Yes
 (20) Q And would you agree that in 1993 both the amount of wild
 (21) pink salmon and hatchery pink salmon returning to Prince
 (22) William Sound were low?
 (23) A Yes
 (24) Q Would you agree that it's your opinion or is it your
 (25) opinion that the actual return to Prince William Sound pink

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- (1) salmon in '92 was something less than 10 million fish?
 (2) A Yes
 (3) Q And you've heard that the predicted total return to Prince
 (4) William Sound for '92 was very high?
 (5) A Yes
 (6) Q In 1993 the actual return of Prince William Sound pink
 (7) salmon was also - was something less than the '92 return?
 (8) A That's right
 (9) Q And you know that the prediction for the return for 1993
 (10) was predicted higher?
 (11) A Yes For 1993 yes
 (12) Q And you know at least generally from what was predicted
 (13) versus the actual returns in both '92 and '93 that the actual
 (14) return was substantially smaller than that was predicted?
 (15) A Yes
 (16) Q In fact you know that the 1992 and 1993 actual returns
 (17) were among the lowest in recent history don't you?
 (18) A Yes
 (19) Q All right Now let's take a look at some of a - or a
 (20) couple of your own findings You agree with the statement that
 (21) pre emergent pink salmon fry in some heavily impacted streams
 (22) incorporated Exxon Valdez hydrocarbons into various tissues
 (23) more than two years after the initial spill don't you?
 (24) A Yes
 (25) Q And you agree with the statement that the hydrocarbons and

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- (1) their metabolites - let me stop Metabolites is what the body
 (2) turns those hydrocarbons into right?
 (3) A Yes
 (4) Q The hydrocarbons and their metabolites induced detectable
 (5) physiological changes in those pre emergent pink salmon fry
 and
 (6) incorporated Exxon Valdez crude into the various tissues don't
 (7) you?
 (8) A I'm sorry I'm not - I'm not familiar with the statement
 (9) you're making
 (10) Q Let's take a look at your deposition at page 146 line 22?
 (11) A Okay
 (12) Q I think that's in volume one sir?
 (13) A Yeah I've got 146 here and line which?
 (14) Q Let's look at line 22 Okay? Let me ask if this question
 (15) was given with reference to a particular report the current
 (16) study demonstrates that pre emergent salmon fry in some
 heavily
 (17) impacted streams incorporated Exxon Valdez petroleum into
 (18) various tissues more than two years after the initial spill and
 (19) that the hydrocarbons and their metabolites induced detectable
 (20) physiological changes and you were asked if you saw that
 (21) sentence and you said yes is that correct?
 (22) A Yes
 (23) Q And then you were asked do you have any comment as to
 the
 (24) author's statement relating to two years after the initial
 (25) spill and you said sure it means that there were still

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- (1) hydrocarbons of sufficient concentration to be detected in the
 (2) tissue analysis didn't you?
 (3) A Yes
 (4) Q And were you asked do you agree or disagree that could
 (5) have been true and you said I'm sure that's true it was also
 (6) true in our data is that correct?
 (7) A Yes
 (8) Q So now you remember?
 (9) A Yes
 (10) MR COOPER Your Honor could we have the next
 (11) question and answer read to put that in context?
 (12) MR JAMIN I'm happy to read the next one then we
 (13) can take a break
 (14) Then you went on and said it's just as your research comes
 (15) to the conclusion -
 (16) MR COOPER That's the question
 (17) MR JAMIN The question it's just that as your
 (18) research comes to the conclusion that that did not have any
 (19) adverse impact on the fish and you said that's right as to
 (20) your research right?
 (21) THE WITNESS Yes
 (22) MR JAMIN Good place for us to end Your Honor
 (23) THE COURT Take our recess now ladies and
 (24) gentlemen We'll be in recess for 15 minutes
 (25) (Jury out at 10:00 a.m.)

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- (1) (Recess from 10 o'clock a.m. to 10:17 a.m.)
 (2) (Jury in at 10:17 a.m.)
 (3) THE COURT You may continue Mr. Jamin
 (4) MR JAMIN Thank you Your Honor
 (5) BY MR JAMIN
 (6) Q Sir there was one area that I asked you a question and you
 (7) didn't agree with me or you didn't know and we were talking
 (8) about whether food items such as copepods amphipods and
 (9) other
 (10) types of zooplankton whether they would tend to
 (11) bioaccumulate
 (12) hydrocarbons that they were exposed to And do you
 (13) remember
 (14) that question?
 (15) A Yes sir
 (16) Q And you indicated that if Mr. Neff felt that they did that
 (17) that would be enough for you?
 (18) A Yeah I don't have any personal knowledge on their uptake
 (19) of hydrocarbons
 (20) Q Okay And Mr. Neff is the sort of person on whom you would
 (21) rely then?
 (22) A Yes sir
 (23) Q Let me just ask you to take a look at his deposition at
 (24) volume six page 1071 the first two lines and you can hold
 (25) that up there
 (26) Have you had a chance to look at that time?
 (27) A Yes I did
 (28) Q That's what Mr. Neff says?

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- (1) A That's what he says yes
 (2) Q Let me move to another area sir and that specifically has
 (3) to do with pink salmon harvested in '91 You examined
 (4) information regarding the quality of pink salmon harvested in
 (5) late 1991 in Prince William Sound did you not?
 (6) A Say again please?
 (7) Q You examined information regarding the quality of pink
 (8) salmon harvested in Prince William Sound in 1991?
 (9) A Yes
 (10) Q And you didn't collect any data of your own on that
 (11) subject?
 (12) A No sir
 (13) Q The gist of the information you examined was that the
 (14) salmon were showing maturation characteristics and they were
 (15) small?
 (16) A Yes
 (17) Q And the salmon were poor quality measured in terms of size
 (18) and color weren't they?
 (19) A Yes
 (20) Q That was in 1991?
 (21) A That's right
 (22) Q And it's your impression that the poor quality has an
 (23) effect on marketability is that correct?
 (24) A Yes sir
 (25) Q And your impression of the 1991 late pink salmon was that

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- (1) they were not of a very good marketable quality is that
 (2) correct?
 (3) A Well I can't speak for the whole quality but looking at
 (4) the variables and size in that population there was definitely
 (5) some small fish that would be hard to market
 (6) Q You did not undertake an analysis as to what may have been
 (7) a cause of the bad appearance of these fish did you?
 (8) A Well maturation was the cause of the bad appearance You
 (9) mean in terms of visual appearance?
 (10) Q Did you do any kind of fieldwork -
 (11) A No sir
 (12) Q - to try to figure that out?
 (13) A No
 (14) Q And in examining the information that you reviewed on the
 (15) quality of 1991 pink salmon that returned late in the season
 (16) you heard that those fish may have returned late because they
 (17) apparently lost their way to the hatcheries is that correct?
 (18) A I heard that yes
 (19) Q And you didn't do any further investigation of that did
 (20) you?
 (21) A No
 (22) Q No science from Exxon on that?
 (23) A No sir
 (24) Q And you were aware of literature that indicates that the
 (25) exposure to hydrocarbons may have an effect on the homing

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- (1) mechanisms of chinook and coho salmon haven't you?
 (2) A Yes
 (3) Q Let's take a look at your conclusions sir Exxon hired
 (4) you to do some work relating to - I just want to clarify this
 (5) to red salmon but you're not talking about red salmon today
 (6) is that right?
 (7) A That's right
 (8) Q So we're talking about pink salmon only?
 (9) A Yes
 (10) Q And you talked about to the jury about a summary of your
 (11) opinions concerning pink salmon population dynamics and
 (12) estimates of fish didn't you? That was that 8980 A Let's
 (13) get that up DX8980 A
 (14) All right Let me ask the question first again sir
 (15) This exhibit 8980 A that you talked about to the jury is
 (16) a summary of your opinions concerning the pink salmon
 (17) population dynamics and estimate of fish populations isn't it?
 (18) A In terms of loss
 (19) Q Is that correct?
 (20) A Right
 (21) Q And the lost population predictions made by ADF&G were
 (22) based on certain life history population dynamics done by Hal
 (23) Geiger from the data he gathered working on the Trustee
 (24) science
 (25) program?
 (26) A Yes

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- (1) Q And you disagree with the population predictions done by
 (2) Geiger and the Trustees here and your best estimate is down at
 (3) the zero range isn't it?
 (4) A I said my estimate would be from zero to the higher number
 (5) there on the right and I say my data indicates that there was
 (6) no impact but to say there was absolutely no impact I
 (7) couldn't say that definitely so I'm someplace in a range
 (8) Q When you talk about impact you're talking about the Exxon
 (9) Valdez oil spill?
 (10) A Yes sir
 (11) Q Would you say that the Exxon Valdez oil spill was a
 (12) substantial factor sir in these numbers the 1 860 000 the
 (13) 70 000 and the 40 000?
 (14) A Based on Mr Geiger's estimate that's what he assumes
 (15) yes
 (16) Q I know Mr Geiger does but I want to try to understand
 (17) what you're saying as you quantify and you say someplace
 (18) between the zero and 1 860 000
 (19) A Yes
 (20) Q Is it your view that the spill or the impact was a
 (21) substantial factor in these failures 1 860 000 the 70 and the
 (22) 40?
 (23) A No I wouldn't think that would be a substantial factor
 (24) but it could go that high yes
 (25) Q It could go that high?

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- (1) A Yes
 (2) Q All right Now you have to appreciate that the jury has
 (3) to go back into the room and do some quantification and
 (4) they're using this 50 percent standard more probable than
 (5) not
 (6) A I'm not aware of that but you can tell me
 (7) Q Okay Well I will tell you that and that's why I want to
 (8) try to test you a little bit more here Is there some range
 (9) above zero where it would be your testimony that it's more
 (10) probable than not that the Exxon Valdez oil spill was a
 (11) substantial factor in causing some damage and if so where's
 (12) that number?
 (13) A Yeah I just think that number would be really hard to say
 (14) because I feel their numbers are at the high extreme and
 (15) therefore I'd be someplace between zero and that - and I'm
 (16) sorry I can't give you a real hard fast number
 (17) Q All right I just wanted to test you But you disagree
 (18) with the population predictions done by Geiger and the
 (19) Trustees
 (20) at the high range fair to say?
 (21) A Yes
 (22) Q And the population loss opinions provided by Dr Mundy
 (23) were
 (24) based on his expertise in population dynamics and fisheries
 (25) management weren't they?
 (26) A He used - I believe he used Mr Geiger's estimates for his
 (27) 1990/91 studies and he was using the different document an

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- (1) earlier document before Mr Geiger recorrected his so
 (2) Mr Geiger had once said it was about 2 181 000 and that was
 (3) the number Mr Mundy was using He didn't - well I mean he
 (4) chose probably not to use Mr Geiger's second estimate of a
 (5) lower estimate
 (6) Q Well actually Mr Geiger's original number was bigger than
 (7) this the 2 101 000 and Mr Mundy made some adjustments to
 (8) Mr Geiger's number isn't that true?
 (9) A I'm not aware he made much adjustment but -
 (10) Q He testified to that we'll stick with that
 (11) A Okay
 (12) Q These other numbers Mr Mundy talked with us about the 20
 (13) million and the 19 million those numbers were based upon his
 (14) expertise as a fellow who had been an Alaska fish biologist a
 (15) fisheries manager a former chief scientist of the Alaska
 (16) division of commercial fisheries and a population dynamicist
 (17) is that not right?
 (18) A Yes
 (19) Q Now other than agreeing with Dr Mundy that the runs were
 (20) down in 1991 and down in 1993 you don't agree with him on
 (21) the
 (22) causes is that right?
 (23) A That's correct
 (24) Q All right Now you're aware that Dr Mundy was certified
 (25) by this Court in population dynamics aren't you?
 (26) A That's right

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- (1) Q And when you were first approached by Bogle & Gates -
 (2) Bogle & Gates is one of the groups of lawyers that s working
 (3) for Exxon here is it not?
 (4) A Yes
 (5) Q And you were asked if you wanted to consult for Exxon as an
 (6) expert You said you didn t That you didn t is that
 (7) correct?
 (8) A Did not yes
 (9) Q And you said no because you felt that the expertise they
 (10) required was someone with a specialty in population dynamics
 (11) is that correct?
 (12) A Yes
 (13) Q All right While you were familiar with population
 (14) dynamics that s just not your expertise?
 (15) A That s right
 (16) Q All right So even though you told Exxon from the very
 (17) beginning that you had insufficient expertise in population
 (18) dynamics you re testifying here in court to contradict Dr
 (19) Mundy who has been certified as a population dynamicist is
 (20) that correct?
 (21) A I would disagree with him yes
 (22) Q Now you also told the jury yesterday did you not that
 (23) before you were hired when you actually signed on with Exxon
 (24) that one of the preconditions was that there would be no
 (25) influence from Exxon and that you would work with consultants

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- (1) like yourself and not Exxon scientists is that right?
 (2) A I realized that Exxon would be involved in terms of the
 (3) study
 (4) Q There d be some involvement?
 (5) A Yes
 (6) Q But you wanted independent scientists didn t you?
 (7) A Yes
 (8) Q All right Now you wrote two papers for those meetings
 (9) that we ve talked about down in Atlanta in 1993 at that ASTM
 (10) conference didn t you?
 (11) A Yes
 (12) Q And one of them dealt with the early stages of pink salmon
 (13) and one of them dealt with the later stages of pink salmon?
 (14) A Yes
 (15) Q And your co author on those papers was a gentleman whose
 (16) name is Al Maki?
 (17) A Yes
 (18) Q And Mr Maki s been in the courtroom?
 (19) A Yes sir
 (20) Q All right And those two papers describe in detail all the
 (21) science you told the jury about yesterday and today?
 (22) A Yes
 (23) Q And you were the lead author on one of those papers
 (24) weren t you?
 (25) A Yes on the early life history

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- (1) Q But down at the ASTM conference Mr Maki presented the -
 (2) both of the papers didn t he?
 (3) A No - oh pardon me the synopsis combining them yes I
 (4) think he did
 (5) Q And the papers say on their cover do they not presented
 (6) to ASTM by Exxon?
 (7) A Would have to look
 (8) Q Okay May I approach Your Honor?
 (9) Does it say at the top for presentation at the third ASTM
 (10) symposium on environmental toxicology and risk assessment
 (11) aquatic plant and terrestrial April 26th to 28th 1993 in
 (12) Atlanta Georgia this manuscript has been submitted by Exxon
 (13) to ASTM for publication and may not be reproduced or
 (14) distributed all rights reserved to Exxon? And that s on both
 (15) of them isn t it sir?
 (16) A Yes Yes it is
 (17) Q Now sir let me ask you can science be inconclusive by
 (18) design?
 (19) A Yes it could be
 (20) Q It can?
 (21) A Yes
 (22) Q And what does that mean?
 (23) A Means that it was designed on a program of investigation
 (24) that wasn t meant to demonstrate a result
 (25) Q All right And I don t believe talked about a - that you

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- (1) didn t find any mechanism that dealt with - that could explain
 (2) what happened in Prince William Sound in 1992 1993 1994
 (3) and
 (4) 1995 right?
 (5) A I didn t look at 94 95 but up to that time yes
 (6) Q You looked at 1992 and 1993 and you testified that there
 (7) was no mechanism right?
 (8) A Yes
 (9) Q But as we ve talked this morning as we ve had an
 (10) opportunity to check here today you ve acknowledged to me
 (11) that
 (12) what the fish eat is very important to their well being?
 (13) A That s right
 (14) Q And you ve acknowledged that there s a whole series of
 (15) studies out there and even Dr Neff recognized that the fish
 (16) eat stuff that s bad for them it s bad for the fish right?
 (17) A Right
 (18) Q And you ve acknowledged for me that there are a series of
 (19) studies out there that attribute the losses we ve talked about
 (20) to genetic damage?
 (21) A Yes
 (22) Q You disagree with him?
 (23) A Right
 (24) Q But you didn t study the genetic damage? In fact you
 (25) started to but then it was stopped is that right?
 (26) A The last study yes
 (27) Q It was stopped and you wanted to keep going but it

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- (1) wasn't - it didn't keep going did it?
 (2) A I'm the one that stopped it
 (3) Q But after it was stopped you wanted to keep going We
 (4) talked about that didn't we?
 (5) A That would be the following year yes
 (6) Q Right Now can science be inconclusive by design because
 (7) you blur data too? Is that a possibility?
 (8) A That would be a possibility
 (9) Q And what does that mean?
 (10) A That means that you would analyze it in a way or - or not
 (11) recognize the conclusions that the data would suggest
 (12) Q All right And if we were - were looking at the issue of
 (13) water quality and we had data from various levels in the water
 (14) and we blended them or averaged them we'd lose some of the
 (15) precision that was available from the data wouldn't we?
 (16) A One would do that yes
 (17) Q Now is it also possible in science to lose some of what
 (18) might be available by using population samples that are too
 (19) small?
 (20) A Yes
 (21) Q All right What does that concept mean? We call it power
 (22) in science don't we?
 (23) A That's right
 (24) Q Could you explain what it is?
 (25) A Means that's your means would be based on a large

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- (1) variability and when you did your statistics on that that
 (2) large variability would not allow you to detect real
 (3) differences in those means
 (4) Q Now that's related to those error bars that we saw around
 (5) the circles in some of your pictures isn't it?
 (6) A Yes
 (7) Q All right And the gist of it is that the error bars
 (8) reflected what statisticians tell us is the range of
 (9) possibilities given a particular sample?
 (10) A Yes
 (11) Q All right And as we increase the size of the sample we
 (12) can very often suck in those error bars is that right?
 (13) A That's right
 (14) Q In fact some of your charts showed that is that right?
 (15) A Yes
 (16) Q Now if we have a sample that's very small in comparison to
 (17) the entirety we can probably expect some pretty large error
 (18) bars?
 (19) A Well yes that's right --
 (20) Q As the sample size increases very often those error bars
 (21) come in?
 (22) A Yes
 (23) Q One way science could be inconclusive by design would be
 (24) if
 (25) our sample - the samples we took of a particular population
 were small rather than large they were small samples rather

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- (1) than larger samples?
 (2) A That's right
 (3) Q Now is another way that science could be inconclusive by
 (4) design is when a scientist isn't told all he needs to know
 (5) about data?
 (6) A Yes
 (7) Q All right And you told me a couple of times today and I
 (8) wrote it down Exxon would only allow me to know what I
 needed
 (9) to know didn't you?
 (10) A Yes
 (11) MR JAMIN I have nothing further sir
 (12) THE COURT Redirect?
 (13) MR COOPER Thank you Your Honor
 (14) REDIRECT EXAMINATION OF ERNEST BRANNON
 (15) BY MR COOPER
 (16) Q Dr Brannon a few questions in a few areas that Mr Jamn
 (17) touched on
 (18) On the last matter that he asked you about you made the
 (19) comment Exxon telling you what you needed to know Can
 you
 (20) explain what you mean by that?
 (21) A Yes I think I can The - the study that I would design
 (22) on pink salmon I would be - would be responsible for There
 (23) might be another scientist doing something on herring another
 (24) scientist doing something on birds another scientist doing
 (25) something on water quality And I wouldn't know who those

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- (1) scientists were or what they were doing and I guess it was
 (2) because they didn't want to bias my opinion one way or the
 (3) other so that I was totally uninfluenced by Exxon's viewpoint
 (4) or viewpoint of other experts
 (5) So when I said only giving the information I needed to
 (6) know that was within the realm of my study Certainly
 (7) anything within my study I was allowed to know or they made
 (8) sure that my data was being accumulated and so forth if that
 (9) was the issue but what I meant by that was that if there's
 (10) anything outside of my area of need to know such as other
 (11) species or other studies that didn't directly affect me I
 (12) didn't even know who was doing it
 (13) Q But with respect to matters in your area of expertise if
 (14) you needed something from Exxon and asked Exxon for
 something
 (15) was it always provided?
 (16) A I wish the university would work that way yes
 (17) Q You're satisfied that you got what you needed?
 (18) A Yes
 (19) Q And you got what you asked for?
 (20) A Yes I did
 (21) Q Now while we're on that general subject Mr Jamn talked
 (22) about the study having to do with genetic effects and you
 (23) recall this is one you testified a few minutes ago that you
 (24) terminated?
 (25) A Yes

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- (1) Q Can you - when was that - when did you start that study?
 (2) Was that last year?
 (3) A Yes I started it in the fall of last year
 (4) Q And just very generally what were you trying to do? How
 (5) were you going to go about it?
 (6) A Well I was aware that the issue was coming up about
 (7) genetic damage I felt I really had to address those issues of
 (8) genetic damage with the egg viability study on the years at
 (9) risk The studies you've already talked about and there was
 (10) concern we should be doing something in that regard so I was
 (11) asked if I would design a study that would follow up my work on
 (12) genetics and I designed that I designed it rather late for
 (13) the pink salmon season because of the limited time I had to
 (14) work on it but I did design it and we did get eggs flown in to
 (15) us to do the study
 (16) Q Just generally the study would have taken eggs salmon
 (17) eggs?
 (18) A Take the eggs from pink salmon expose them to oil, much
 (19) like the Auke Bay study is doing now
 (20) Q You take the eggs and artificially spawn them and keep them
 (21) in a laboratory to see how well they did?
 (22) A Just exactly like the hatchery procedures
 (23) Q And as is typical in some of these studies you've talked
 (24) about already that would involve a group that was then
 (25) subjected to an oil treatment and a group that was not

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- (1) subjected to an oil treatment?
 (2) A Yes that's right We would have a control that would not
 (3) have any of the experimental levels of oil but just our
 (4) freshwater control as an example of what it would be without
 (5) the presence of oil
 (6) Q Why do you use - why do scientists use a control group?
 (7) A That's one of the ways you could blur your data I guess
 (8) if you didn't use a control you wouldn't know what to compare
 (9) it with
 (10) Q Do you worry about whether or not the controls are
 (11) appropriate controls?
 (12) A That's right
 (13) Q And in this case what happened with your control group?
 (14) A My controls all died
 (15) Q What did that - these were eggs that hadn't even been
 (16) subjected to any oil?
 (17) A That's right In the process - often when you fly eggs
 (18) some distance if the person doing the spawning has altered
 (19) their incubation success in some way or just the high
 (20) elevation frankly I don't know what it is that caused it but
 (21) sometimes we blank out on flying eggs to lab for
 (22) experimentation It's probably happened - 20 or 30 percent of
 (23) my experience comes with poor quality of eggs shipped in like
 (24) that
 (25) Q Now it took a while for the eggs - for the control eggs

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- (1) to die?
 (2) A Yes If you don't - if you don't move them If you're
 (3) very careful and don't move them you don't shock them and
 (4) even though the egg cannot live it's kind of suspended in that
 (5) situation That little membrane keeps the bacteria and
 (6) everything away from the yolk and so it doesn't turn white and
 (7) so it doesn't look like it's dead but it is dead
 (8) Q So when you found the controls died you couldn't go
 (9) forward with the experiment?
 (10) A That meant that the study was useless
 (11) Q And what did you want to do then? Did you want to get some
 (12) more eggs and start over?
 (13) A I had already taken eggs at the very end of the run so I
 (14) knew there was no eggs left
 (15) Q You couldn't get more eggs in 1993?
 (16) A No
 (17) Q So the next opportunity to get any eggs in order to do the
 (18) study would have been when?
 (19) A This fall
 (20) Q And you would have had to have gotten the eggs
 (21) artificially spawned them and allowed them to hatch and study
 (22) the results Is there any way that you could have done that by
 (23) the time of this trial?
 (24) A No I would have to be taking the eggs next week or week
 (25) after next

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- (1) Q Is that why the study wasn't pursued?
 (2) A That's right
 (3) Q In terms of the trial it wouldn't mean anything?
 (4) A That's right
 (5) Q You wanted to pursue it just from the standpoint of pure
 (6) science?
 (7) A Oh yes I would like to continue those - that kind of
 (8) study
 (9) Q But it wouldn't have shed any light on - by the time of
 (10) the trial that we're involved in now?
 (11) A I wouldn't have the results until 1994 late 1994
 (12) Q I guess under those circumstances you don't criticize Exxon
 (13) for not wanting to go ahead and pursue it?
 (14) A Well I'll still criticize them yeah
 (15) Q From the standpoint that you would have liked to have seen
 (16) it done for science?
 (17) A Yeah right
 (18) Q Could we have Exhibit 5720 A please?
 (19) Now you remember Mr Jamin asked you about some of the
 (20) data points on Dr Neff's chart?
 (21) A Yes
 (22) Q I think we're going to get that up here in a minute
 (23) A That wasn't the one
 (24) Q I think this was it actually
 (25) A Yeah

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- (1) Q And if I recall he asked you in a question if it wasn't
 (2) true that these data points are averages Do you remember that
 (3) question?
 (4) A Yes
 (5) Q And I think you then said if I heard it right you said
 (6) you suspect I think suspect was the word that you used You
 (7) suspected that they were Do you remember that?
 (8) A Yes I didn't know if they were some that were actually
 (9) averages of other samples
 (10) Q And then there was some discussion between you and
 (11) Mr Jamin about whether or not if these were just averages
 (12) that wouldn't mean that there were higher spikes that someho
 (13) got averaged down?
 (14) A Yes
 (15) Q Well let me just point out over here on the caption where
 (16) it says samples eight over ten PPB 840 over ten does that
 (17) suggest to you that your suspicion may have been wrong that
 (18) indeed these were individual samples?
 (19) A Yes
 (20) Q You were not here for all of Mr Neff's -
 (21) A No I wasn't
 (22) Q - testimony? Let me read from the transcript of
 (23) Mr Neff's testimony at the trial This is June 29 at page
 (24) 5690
 (25) Kind of frightening to think that we're at page five

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- (1) thousand six hundred and some already
 (2) THE COURT That is frightening
 (3) BY MR COOPER
 (4) Q But he was asked the question are each of these points
 (5) either an Exxon or a NOAA data point or are they dash are
 (6) they averages? Answer no these are each individual data
 (7) points individual water samples
 (8) Does that clear up any question in your mind as to whether
 (9) these are averages or individual samples?
 (10) A It certainly clears up the issue of whether they're
 (11) averaged or not From my perspective the values are so low
 (12) it doesn't matter whether they're averages of a hundred or
 (13) one It's so low beyond the level of effect that - that was
 (14) my main concern in terms of looking at the water column but
 (15) that does satisfy the question from the standpoint of single
 (16) samples yes
 (17) Q Now Mr Jamin asked you a number of questions about a
 (18) study that Mr Rice was doing I believe the study at Auke
 (19) Bay Do you recall that general subject matter?
 (20) A Yes
 (21) Q And I think he showed you a summary a document that
 (22) summarized or indicated some of the data and so forth?
 (23) A Yes
 (24) Q And you're familiar basically with how Mr Rice is
 (25) conducting that study?

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- (1) A Yes He's doing the study I would have liked to have been
 (2) doing down there in
 (3) Q You mean the - the one we were just talking about the egg
 (4) to the control?
 (5) A Yes the genetic study
 (6) Q Controls all died On Mr Rice's study describe generally
 (7) how that is set up Is he flowing water over gravel that he's
 (8) loaded with oil?
 (9) A He's put eggs in PVC plastic tubes columns that are
 (10) several feet high He's put gravel in those columns he's
 (11) mixed that gravel with oil prior to putting it in the columns
 (12) Then he puts eggs on top of screens and allows them to hatch
 (13) out and go down through the screen into the gravel and
 (14) incubate
 (15) He's using aluminum screens which we wouldn't use in fish
 (16) culture situations because aluminum can be toxic to eggs but
 (17) the eggs then hatch out and the alevins go down through the
 (18) gravel and incubate in that high concentration of oil on
 (19) gravel
 (20) Q That's the point that I want to get to is this
 (21) concentration but I guess we've got a couple of different
 (22) measurements We know the amount of oil the dosage in the
 (23) gravel and the sediment where these eggs are incubating?
 (24) A Yes they've added that based on grams of oil to grams of
 (25) substrate and that's total oil

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- (1) Q Okay We also - they've also measured the amount of oil
 (2) one form or another PAHs or VOAs or whatever the water that
 (3) is coming off of that substrate?
 (4) A Yes They will take samples of the effluent from those
 (5) pipes the waters flowing through the pipes and do analysis on
 (6) that
 (7) Q But these little eggs and alevins are being exposed not
 (8) only to whatever oil that may be in that water but also
 (9) whatever may be in the sediment?
 (10) A No It's primarily what's on the sediment because you see
 (11) that 50 parts per billion only occurs for the first few days
 (12) Q That's in the effluent?
 (13) A In the effluent then it drops right back down to less than
 (14) 10 parts per billion and even less than that So it's
 (15) primarily the effect of oil on the rocks that he's measuring
 (16) Q You've looked at what those measurements are haven't
 (17) you?
 (18) A Yes
 (19) Q Let me call up if I may Defendants Exhibit DX8900
 (20) You prepared this graph which reflects the sediment
 (21) dosages?
 (22) A That - that is his figures showing the concentrations of
 (23) oil based on his dose levels of how many grams of oil he put
 (24) on the gravel and he's got them in the - he had six - six
 (25) concentrations but because of some problems with his
 incubation set up he had to eliminate one and so he's got the

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- (1) zero the control
- (2) Q So this is no oil for these samples being raised in this?
- (3) A Right
- (4) Q And what is this?
- (5) A That's the 1 gram per kilogram of gravel 5 grams per
- (6) kilogram of gravel 15 grams per kilogram of gravel and 57
- (7) grams
- (8) Q When you were - Exxon was conducting the studies and going
- (9) out to the streams and so forth doing the samples were samples
- (10) taken of the actual oil loading in the oiled stream sediments?
- (11) A Yes that's right
- (12) Q And is that reflected on here?
- (13) A That's that hatched bar there on top 96 percent of the
- (14) field sample values fell within that range so it's something
- (15) between 0 and 0.1
- (16) Q This one happens to be on survival As you look at this
- (17) was there any effect on survival of these pink salmon in his
- (18) experiment at the levels that were actually experienced out in
- (19) the field?
- (20) A No And another thing you have to realize that he's
- (21) testing fresh oil It's unweathered Prudhoe Bay crude oil and
- (22) so when you leave the oil sit out there for three weeks before
- (23) it even gets to the streams or - or a week before it gets to
- (24) the streams it's weathered and it's lost much of its
- (25) toxicity So you can't even compare the concentrations and say

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- (1) A Yes
- (2) Q - VOAs VOAs?
- (3) A Yes
- (4) Q Do you recall that?
- (5) A Yes
- (6) Q And you said in your answer something to the effect if I
- (7) heard it right that you thought it was incorrect to suggest
- (8) that?
- (9) A That report we're referring to is a preliminary report and
- (10) Mr Rice will never put that in a peer reviewed journal because
- (11) the reviewers would catch that that he's using the effluent
- (12) concentration but talking about the oil contact on gravel as
- (13) actually the factor that's influencing the mortality and I'm
- (14) sure Mr Rice would correct that before he would allow that to
- (15) go out in print So that's a preliminary report and it would
- (16) be incorrectly stated if that's how it remained
- (17) Q Because what he's doing is really bearing on exposures in
- (18) the sediments as opposed to exposures in the water column?
- (19) A That's right He's got lots of data from other studies
- (20) that shows the tolerance level to oil in the water column is
- (21) much much higher than 50 parts per billion
- (22) Q All right Now another thing that Mr Jamin did was to
- (23) ask you a series of questions about places where you disagreed
- (24) with Trustee Council scientist studies do you remember that?
- (25) A Yes

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- (1) they're equivalent
- (2) Q And where do you first get the - where do you think you
- (3) first get a significant effect here on the various dosages on
- (4) survival?
- (5) A He didn't get any significant difference until he got past
- (6) 15 so someplace between 15 and 57
- (7) Q So based on all of that do you - what conclusion do you
- (8) arrive at about what that study reveals insofar as effect of
- (9) the oil on these embryos in the streams?
- (10) A As a scientist concerned about fish biology and oil it
- (11) makes me feel very good that they actually are very tolerant of
- (12) the concentrations we measured in the gravel and in the water
- (13) column and it has to get a devil of a lot higher before it
- (14) causes any problem to fish or to pink salmon
- (15) Q Do you feel this actually confirms the work that you did?
- (16) A My genetics work wasn't like this and I didn't do any dose
- (17) levels in terms of where did the fish die with high doses I
- (18) just measured what was in the stream and those - those levels
- (19) were very very very low
- (20) Q Now when Mr Jamin was cross examining you about this
- (21) subject I think that he asked you about whether or not this
- (22) information was going to result in or should result in a
- (23) lowering of that 10 parts per billion of -
- (24) A Yes
- (25) Q - volatile -

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- (1) Q And if I heard it right I may not have but if I heard it
- (2) right it sounded to me like most all of them if not all of
- (3) them dealt with the subject of embryo mortality in the
- (4) streams?
- (5) A Most of them dealt with that
- (6) Q And you disagree with the embryo mortality studies for the
- (7) reasons that we talked about at length on -
- (8) A Yes
- (9) Q - on direct examination and in a nutshell that's because
- (10) of the problems with the fall sampling which is where they get
- (11) their embryo mortalities?
- (12) A That's right
- (13) Q So most of those questions that you were responding to
- (14) when
- (15) you said you disagreed is for the very reasons that you
- (16) explained at length in your direct examination?
- (17) A At great length I think
- (18) Q I won't ask you if it was too long
- (19) Now to the extent - well let's see if we could call
- (20) up - well maybe I could do it without putting up the exhibit
- (21) again but he asked you also about effects that some other
- (22) scientists for the Trustee Council had discussed including Mr
- (23) Willette and Mr Wortheimer do you remember that?
- (24) A Yes
- (25) Q Those individuals were studying to see whether there was an
- (26) effect on the growth or the size of the fish I think young

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- (1) pink salmon?
 (2) A That s right
 (3) Q Now I d like to just put that into context in terms of
 (4) what that translates into Even if they re correct their
 (5) findings don t really jibe with your findings I gather?
 (6) A Well their sample sizes were extremely small
 (7) Q Is that a design problem like Mr Jamin was talking to you
 (8) about?
 (9) A Yes They had just very very small samples it was hard
 (10) for them to conclude They were probably doing the best they
 (11) could with what they had but they just didn t have the sample
 (12) size to make the kind of transition from their growth
 (13) assessment to the adult return data
 (14) Q But if you assume that they re right one of the Trustee
 (15) studies then tried to synthesize did it not what all of that
 (16) would - including the embryo mortality in terms of damage on
 (17) the population?
 (18) A Yes That was Mr Geiger He took the Sharr studies
 (19) which was the embryo or egg mortality the Willette studies
 (20) which was the early marine growth and Wortheimer studies
 (21) which also were involved with early marine growth and came to
 (22) the conclusion that there was a damage or level of damage
 (23) associated with that
 (24) Q And that level of damage if we could have DX8980 A that
 (25) level of damage is what is included in this range That s

- (1) variables
 (2) Q However he gets to those numbers?
 (3) A That s right
 (4) Q Now that reminded me that Mr Jamin was suggesting that -
 (5) that Dr Mundy had some unique qualifications here because
 he s
 (6) a population dynamicist Do you recall that general
 (7) discussion?
 (8) A Yes
 (9) Q Now you were qualified in this court as an expert on
 (10) several matters including effect of oil on salmon do ou
 (11) recall that?
 (12) A Yes
 (13) Q I don t know if you were here when - I don t think you
 (14) were here when Dr Mundy testified?
 (15) A No I wasn t
 (16) Q You don t know one way or the other - well -
 (17) A I haven t even read his testimony
 (18) Q You don t know whether he was qualified as somebody with
 (19) expertise in studying the effects of oil on the salmon?
 (20) A I don t know how he was presented no
 (21) Q Did Mr Mundy was he the principal investigator on a
 (22) single one any of the Trustee studies?
 (23) A No he wasn t
 (24) Q On the pink salmon?
 (25) A No

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- (1) really the high end of the range that s reflected on this
 (2) exhibit?
 (3) A That s right That would be the center column would be
 (4) the upper three or four lines there would be what Alaska Fish
 (5) & Game has used Mr Geiger used the Sharr data and the
 (6) Willette data and the Wortheimer data to come up - and that s
 (7) the magnitude of their effect
 (8) Q Now these big numbers here the 92 93 94 and 95
 (9) which are much larger obviously than these ADF&G Trustee
 (10) numbers who came up with those numbers? Whose numbers
 are
 (11) those?
 (12) A I believe the first - that 92 93 columns are Dr
 (13) Mundy s numbers
 (14) Q And there s no Trustee study that you re aware of that says
 (15) those - that comes up with those numbers is there?
 (16) A No Mr Mundy would be depending on the Trustee
 (17) scientists data in some way in interpreting that
 (18) Q Have you ever seen anything where he explains how he gets
 (19) to those numbers?
 (20) A Well as a population dynamicist Mr Mundy has not been
 (21) involved in actually collection of data in the field He would
 (22) be using some other s data and in order for the population
 (23) dynamicist to make a good estimate he has to have good data
 (24) He has to have - the variables that go into his model have to
 (25) be accurate and unfortunately Mr Mundy has been using
 faulty

- (1) Q As far as you know he did no original work of his own?
 (2) A That s correct
 (3) Q He was never out in the field supervising data collection
 (4) he wasn t - he was not in any of the studies?
 (5) A I just don t know Not to my knowledge no
 (6) MR COOPER Your Honor I don t have any further
 (7) questions
 (8) THE COURT Thank you sir you may step down You
 (9) may call your next witness
 (10) MS STEWART Your Honor defendants would call Al
 (11) Menin It s done by video deposition
 (12) MR COOPER Your Honor before we do that I think I
 (13) neglected to offer into evidence that one exhibit I used on
 (14) redirect DX8900 regarding the Rice study
 (15) (Exhibit 8900 offered)
 (16) MR JAMIN No objection whatsoever Your Honor
 (17) THE COURT Defendants Exhibit 8900 is admitted
 (18) (Exhibit 8900 received)
 (19) (Videotape Played)
 (20) DIRECT EXAMINATION OF ALBERT MENIN (Video)
 (21) BY VIDEO EXAMINER
 (22) Q Could you state your name and address please Mr Menin?
 (23) A Oh my name is Albert Menin I live at 13820 Kinbrook
 (24) Street Sylmar California spelled S Y L M A R 91342
 (25) Q And how old are you sir?

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- (1) A 66
 (2) Q What is your profession?
 (3) A Electronic engineer Retired now
 (4) Q Okay What background do you have in the field of
 (5) electronic engineering?
 (6) A My entire life since I was a kid
 (7) Q Okay Could you describe generally for me what your
 (8) background is in that area?
 (9) A Basically electronic engineering I started out in Bendix
 (10) Corporation as a technician and eventually became engineer
 (11) Q Do you have an educational background in electronic
 (12) engineering?
 (13) A Yes Not very impressive but approximately two years in
 (14) about three colleges
 (15) Q Which colleges were those?
 (16) A Let s see Milwaukee College of Engineering in Milwaukee
 (17) Wisconsin UCLA where I took some courses San Francisco
 (18) City College Heal Engineering College in San Francisco That s
 (19) about it
 (20) Q When was it that you joined Bendix?
 (21) A I think it was 1952
 (22) Q How long were you with Bendix?
 (23) A 35 years
 (24) Q Was your entire career at Bendix spent in the field of
 (25) electronics and electronic engineering?

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- (1) A Yes
 (2) Q Are you one of the inventors of the Bendix side scan sonar
 (3) that s used to count adult salmon in Alaska rivers?
 (4) A Yes
 (5) Q And could you describe for me what your involvement was in
 (6) that invention?
 (7) A Oh I basically designed it - when we first started first
 (8) got the contract from Alaska Fish & Game it was given to one
 (9) engineer who passed it on to another And I was a technician
 (10) at that time and it sounded like a very interesting program
 (11) so I went to Alaska - well I was given the task of aiding in
 (12) the design of the first counter which doesn t even resemble
 (13) the current salmon counters And eventually I got most of
 (14) the - well all the electronic design responsibility and
 (15) every year Alaska would require - request improvements to
 (16) make
 (17) them simpler to use And that was basically it
 (18) Q Were there others at Bendix who were involved in designing
 (19) the hydroacoustic aspects of the counting system?
 (20) A Yes They re no longer - none of them are there anymore
 (21) They re all retired
 (22) Q And the patents that were filed with respect to the
 (23) inventions that rose from that work to date include both your
 (24) name and the names of others at Bendix?
 (25) A Yes uh huh
 (26) Q You indicated I think that you left Bendix after 35

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- (1) years in what 1987? Is that roughly right?
 (2) A It was either 87 or 88 June I have the exact date in
 (3) my pocket if you re interested
 (4) Q I think that s good enough for now
 (5) A Oh all right
 (6) Q Since the time you left Bendix have you continued to do
 (7) private consulting in the fish counting field?
 (8) A Yes I - I go - I come up to Alaska in the summer to help
 (9) train people because there s a turnover in Fish & Game so I
 (10) teach them how to use the equipment and basically to make
 (11) any
 (12) repairs inseason repairs
 (13) Q Okay So you ve had contracts just between you personally
 (14) and the State Department of Fish & Game since the time you left
 (15) Bendix to do that kind of work?
 (16) A Right.
 (17) Q Have you done contracting work for other entities related
 (18) to fish counting since you left Bendix?
 (19) A Oh yeah South Carolina
 (20) Q State of South Carolina?
 (21) A Right
 (22) Q Do they still use Bendix side scan sonars to count fish
 (23) there?
 (24) A Yes
 (25) Q Just so I understand did the State of Alaska at some point
 (26) while you were at Bendix hire Bendix to develop and install

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- (1) sonar counters on Alaska rivers?
 (2) A Yes
 (3) Q Did that start sometime in the 1960s?
 (4) A Right 1965 was the very first one
 (5) Q And as part of your job responsibilities at Bendix did you
 (6) come to the state of Alaska every summer starting in 1965 to do
 (7) work on those counters?
 (8) A Yes
 (9) Q And since the time you left Bendix have you been hired by
 (10) the State each summer to come and do that same type of work?
 (11) A Right
 (12) Q That would include this past summer 1992?
 (13) A Correct.
 (14) Q You plan to come again in the summer of 93?
 (15) A Yeah I hope to
 (16) Q Has the State asked you to?
 (17) A No It s sort of unwritten
 (18) Q I know they go through a budget process at this time of the
 (19) year Do you have to wait until after that s over to find out
 (20) if they want you to come back?
 (21) A That s correct but I assume it ll be okay
 (22) Q Do you usually visit all of the sites where there s an
 (23) adult salmon counter during the course of that July trip?
 (24) A No I used to but now for budget reasons I ll visit
 (25) typically four five sites

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- (1) Q What are the ones that you re most likely to visit?
- (2) A Oh Copper River Kenai River in Soldotna and then Crescent
- (3) River that s in Cook Inlet and there s one more there I
- (4) forgot the name of it now
- (5) Q The Kasilof you visit that one?
- (6) A The Kasilof right and Yentna That s the one I couldn t
- (7) think of It s Y E N T N A
- (8) Q So the ones that you visit most frequently are the systems
- (9) in Upper Cook Inlet and the one over on the Copper River in
- (10) Prince William Sound?
- (11) A Right I used to go annually to northern Alaska but they
- (12) haven t requested me there
- (13) Q When you make this trip in July to the various locations
- (14) that you ve identified what do you do on those trips during
- (15) July?
- (16) A Oh repairs and many times I ll build small pieces of
- (17) equipment that - to make the salmon counters more easily
- (18) usable One good example is this last year at Crescent River
- (19) the - there s a salmon run only in spurts you know an hour a
- (20) day or so and not predictably and the field camp was across
- (21) the river and it was a dangerous river to cross
- (22) I built a device that when salmon are passing and counting
- (23) it blares out on a loudspeaker which they can hear from a
- (24) thousand feet away Little things like that to make life
- (25) easier for the biologists

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- (1) Q Do you spend time on those trips in July training new
- (2) personnel if there are new crew at those locations?
- (3) A Right
- (4) Q And what do you do to train personnel? How do you go
- (5) about
- (6) that?
- (7) A Oh I show them how to use it use the counter show them
- (8) what to look for You know if there are any problems how to
- (9) identify them and show them how to use an oscilloscope which
- (10) they use to verify the accuracy of the counters while the fish
- (11) are passing
- (12) Q Have - based on your work here in the state of Alaska for
- (13) the last oh well I guess it s 27 going on 28 years now
- (14) have you received any awards or commendations from the
- (15) State
- (16) for your work?
- (17) A Yeah quite a few I ve got a plaque that was given to me
- (18) by Governor Hammond in the dead of winter and I had to make
- (19) a
- (20) trip up to Juneau for that
- (21) Q What was that award for?
- (22) A Well for contributing to the advancement of fisheries
- (23) Q Do you recall what year that was?
- (24) A It was in the 70s And oh I ve gotten a lot of informal
- (25) awards - oh one other for 25 years of dedicated fishery
- (26) scientific help
- (27) Q Is that from the Department of Fish & Game?
- (28) A Right Right

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- (1) Q So you actually came up to Juneau and shook hands with
- (2) the
- (3) governor and received an award sometime in the 70s?
- (4) A Uh huh Right In fact he was my first floatplane pilot
- (5) before he became governor
- (6) Q Are you familiar with an allegation that s been made that
- (7) in years of very large runs that is sockeye runs that Bendix
- (8) side scan sonar counters tend to undercount the number of fish
- (9) coming by?
- (10) A No
- (11) Q You never heard that?
- (12) A Well let s see I - I think at that last deposition for
- (13) the Glacier Bay spill I think it was mentioned
- (14) Q Do you believe there s any truth to it?
- (15) A No
- (16) Q Why is that?
- (17) A Well from what I ve observed the counters have been able
- (18) to keep up with the largest migrations I ve seen
- (19) Q And then when was it that you came back to the idea of
- (20) doing a side scan system?
- (21) A 75
- (22) Q Where was the first of the new side scan sonars to go in?
- (23) A We tested it first in Wood River in clear water to verify
- (24) the accuracy and also in a couple other clear rivers in
- (25) northern Alaska the Anvik Aniak and in a weir somewheres
- (26) around - not too far from Anchorage to verify the accuracy

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- (1) Q Where did you first deploy that system on a permanent basis
- (2) as opposed to just testing it?
- (3) A In - on the Kenai River
- (4) Q Do you recall what year that was?
- (5) A Oh my guess would be 77 or 78
- (6) Q And has essentially the same type of system been in place
- (7) on the Kenai ever since then?
- (8) A Yeah the same principle It s been radically improved to
- (9) make it easier to operate consume less power It runs from
- (10) solar power
- (11) Q But the counting itself is done the same way?
- (12) A Basically yes
- (13) Q Okay You mentioned that you put it in the Anvik and the
- (14) Copper as well as the Kenai What other rivers has that
- (15) system been deployed on since you first came up with it?
- (16) A Well the Crescent River Kasilof Yentna Anvik Aniak -
- (17) I did say Copper River right?
- (18) Q Right
- (19) A And Nushagak River And I can t think of any others at the
- (20) moment
- (21) Q Why did the new system - why was it used instead of the
- (22) older one?
- (23) A It was much easier to deploy and it could be monitored much
- (24) more accurately You re looking on an oscilloscope you re
- (25) observing one transducer as opposed to 30

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- (1) Q Why is that easier to monitor?
- (2) A Well at the time I could only monitor - on the upward
- (3) looking system I could only monitor three transducers at a
- (4) time It was multi plexed screens so I could only look at
- (5) three at a time And if the salmon weren't crossing in that
- (6) spot you'd miss them but on the side scanner you can
- (7) observe
- (7) the entire counting range at any time on the oscilloscope see
- (8) one fish pass or when there's nothing there
- (9) Q Have you visited all of these sites that you've identified
- (10) where side scan sonars were installed?
- (11) A Right
- (12) Q Have you been at the Kenai sonar site at the time of a peak
- (13) of the sockeye run?
- (14) A Yes uh huh
- (15) Q Are you typically there every year at the peak?
- (16) A Typically at the peak although I have - I've missed a
- (17) couple peaks
- (18) Q When you have been there at the time of the peak of the
- (19) run have you observed any problems that the system
- (20) encounters
- (20) with counting the number of sockeye passing at that point?
- (21) A No No Actually the Nushagak has a far larger peak
- (22) Q And have you been on the Nushagak River when the peak of
- (23) the run is going by?
- (24) A Yes for about the past six seven years It's typically
- (25) July 4th

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- (1) Q Have you observed any problems with the side scan sonar's
- (2) ability to deal with that peak run?
- (3) A No
- (4) Q With respect to the sonar systems in place in Upper Cook
- (5) Inlet and at the Copper River location you identified have
- (6) they been deployed and used in essentially the same manner
- (7) each
- (7) year since the late 70s?
- (8) A Yes
- (9) Q Do you have an opinion about the accuracy of the Bendix
- (10) side scan sonar in counting return of adult sockeye salmon?
- (11) A Only based on what I've seen in clear rivers and reports
- (12) from Fish & Game personnel that you know we've gotten as
- (13) high as 98 percent correlation between visual counts and
- (14) electronic counts
- (15) Q Okay so what is your opinion about the accuracy of the
- (16) side scan sonar?
- (17) A I think it's quite accurate
- (18) Q That's based on you mentioned there was some tests in
- (19) clear water systems and some reports from ADF&G people?
- (20) A Right
- (21) Q We'll get into those tests specifically in a little bit
- (22) but could you tell me what reports you have in mind that have
- (23) been prepared by ADF&G that you're referring to?
- (24) A Well there's quite a few of them Almost every year I'll
- (25) get one or two in the mail telling me how actually it worked

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- (1) Q But you've seen reports from ADF&G that in your mind
- (2) confirm the accuracy of the counting?
- (3) A Right and I was present at many of the tests
- (4) Q You mentioned some tests that were done in clear water
- (5) systems Was one of those done on the Wood River in or about
- (6) 1977?
- (7) A Yes 75 76 77 In fact every time any modification
- (8) was made to the counter we'd try it on Wood River
- (9) Q Okay
- (10) A Since the water's extremely clear
- (11) Q Were you involved in that test?
- (12) A Yeah
- (13) Q With what did you do?
- (14) A I observed - I would take turns with another biologist
- (15) there One of us would have our back to the river just
- (16) watching the oscilloscope and the other looking in the river
- (17) and counting the fish with a mechanical tallywacker and we'd
- (18) compare each other's counts to the electronic counts the side
- (19) scanner counts
- (20) Q What did those tests show?
- (21) A Very good accuracy
- (22) Q In other words there was a close correlation between the
- (23) tallywacker counts and the oscilloscope counts?
- (24) A Yes
- (25) Q Do you recall how close the correlation was?

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- (1) A If I remember right it was on the order of 95 percent It
- (2) would drop to 90 percent at times sometimes we'd hit almost a
- (3) hundred percent I think that averaged around 94 95 percent
- (4) correlation
- (5) Q Are those tests memorialized in a report?
- (6) A I didn't but - I believe the Fish & Game did In fact
- (7) I'm quite sure Fish & Game documents everything I don't
- (8) remember having seen that lately but I vaguely remember that
- (9) they were documented
- (10) Q Those Wood River tests was that a matter of several days
- (11) you did that that summer?
- (12) A Yes
- (13) Q Did you do any tests on any other clear water systems that
- (14) year do you recall?
- (15) A Well no One year we had time to do two clear water
- (16) tests the one being in Wood River and then the Anvik which
- (17) was very clear
- (18) Q So you went to both rivers in one season?
- (19) A Right
- (20) Q Could you tell me what you did in that test on the Anvik?
- (21) A It was extremely clear water so it - a tower a counting
- (22) tower was set up In fact that's what they used to use to
- (23) count the fish there It was about a 30 foot high aluminum
- (24) tower right next to the river and they counted the fish
- (25) visually while we counted them electronically and they

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- 1) compared the count
 2) Q So in this test you were comparing tower counts to sonar
 3) counts?
 4) A Yes
 (5) Q And do you recall what the results of those tests were?
 (6) A Yeah That one ran around 98 percent correlation
 (7) Q Did you find that the tower counts differed as among
 (8) various counters who were on the tower that is different
 (9) individuals would come up with different counts?
 (10) A Right
 (11) Q Okay I d like to ask you now if you recall testing done
 (12) on the Russian river in the 70s?
 (13) A Oh yeah We - we did a clear water test It was near a
 (14) weir and there weren t many fish involved but we - we got
 (15) better than 90 percent accuracy on that one That was clear
 (16) water
 (17) Q I d like to ask about another clear water test location
 (18) the Nushagak Do you recall doing some testing there in July
 (19) of 1984?
 (20) A Right
 (21) Q The side scan sonar?
 (22) A Yes
 (23) Q Can you describe for me what you did on that occasion?
 (24) A Okay That was when we decided to try to go without a
 (25) substrate this fifty long - 60 foot long pipe that we used to

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- (1) level the river bottom so we wanted a good comparison What
 (2) we did was put two counters of different vintages two to three
 (3) years apart in vintage
 (4) We put them on the same side of the stream so they would be
 (5) counting the same fish and I believe it was 1600 feet apart
 (6) quite a jog and we ran that through the entire run That run
 (7) was roughly a quarter million fish and they were within one
 (8) percent of each other
 (9) Q Okay So that s testing two different vintages of the
 (10) sonar counters against each other?
 (11) A Right
 (12) Q And the counts were very closely correlated?
 (13) A I was amazed they were that close really It was
 (14) documented by Mack Minard Eric Minard E R I C I believe
 (15) Minard M I N A R D
 (16) Q He was with Fish & Game?
 (17) A Right Still is
 (18) Q And it sounds like you counted a large volume of fish on
 (19) this occasion is that right?
 (20) A Yeah It was roughly a quarter million if I remember
 (21) right
 (22) Q So you were there for a matter of a number of days?
 (23) A Right That occurred I think over a week and a half
 (24) period
 (25) Q Based on your experience with the Bendix side scan sonars

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- (1) do you have any reason to believe that they ever get into
 (2) situations where they re chronically overcounting or
 (3) undercounting?
 (4) A No not for more than a few minutes because they re
 (5) monitored constantly And the people at least in Cook Inlet
 (6) are quite experienced and well trained and when the fish
 speed
 (7) up when their velocity speeds up there tends to be an
 (8) undercounting So it s very easily compensated for by
 (9) observing the oscilloscope and twirling a dial which is called
 (10) a fish velocity dial and vice versa when they slow down they
 (11) would tend to be overcounted And they do - over a period of
 (12) a day it will speed up and slow down so they re - they have
 (13) to be - excuse me they are monitored frequently
 (14) Q Who are the people in Cook Inlet who operate those counters
 (15) or who are primarily responsible for the operation of the
 (16) counters?
 (17) A Bruce King Randall Davis Jim Tarbox and people who work
 (18) for them
 (19) Q Do you have based on your - strike that
 (20) Have those people been involved in operating those sonar
 (21) counters for a number of years?
 (22) A Oh yes quite a number
 (23) Q Have you worked with them at those sonar counting sites?
 (24) A Yes
 (25) Q Do you have an opinion about their qualifications to

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- (1) successfully operate sonar counters?
 (2) A Yeah they - they re good well-experienced and very
 (3) good Randall Davis and Bruce King are probably the two most
 (4) experienced and they ve been around in Cook Inlet for quite a
 (5) while
 (6) Q I m talking now about when you were at the sonar site on
 (7) the Nushagak during the peak of the run which you said was
 the
 (8) largest you ve observed I m curious how many counts you
 (9) received per second on the counter if you can recall?
 (10) A I can remember 30 000 an hour
 (11) Q And what s the most number of spikes or pulses you ve seen
 (12) on the oscilloscope when a run of that size was going?
 (13) A Oh 10 on the order of 10 at any given time during the -
 (14) during the peak
 (15) Q And in your observation was the counter able to count that
 (16) number of fish passing at a time?
 (17) A Oh yeah Yeah you can see them on the oscilloscope The
 (18) counter can count them because it can literally count a few
 (19) million per second you know which is impossible
 (20) Electronically there s no problem
 (21) Q Mr Menin we talked earlier about the accuracy of the
 (22) counters as deployed in Upper Cook Inlet specifically Do you
 (23) recall any seasons during the 1980s when there were any
 (24) persistent or chronic problems that caused sonar counts in any
 (25) of the Upper Cook Inlet counting units to be significantly off

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- (1) or to cause significant errors?
 (2) **A** No No From time to time there s been electronic
 (3) failure but that s a catastrophic one and they have spare
 (4) counters have spare parts and they can repair them within
 (5) minutes
 (6) **Q** In your experience have the Fish & Game people you ve
 (7) worked with on sonar counting been satisfied with the quality
 (8) of the salmon estimates that are generated through that
 (9) process?
 (10) **A** Right
 (11) **Q** I d like to focus just for a minute on the year 1989 Do
 (12) you recall any particular problems with the sockeye sonar
 (13) counters in that year vis a vis the other years that you ve
 (14) worked on them?
 (15) **A** No
 (16) **Q** Were they operated in essentially the same fashion that
 (17) year as in other years?
 (18) **A** Yes every year
 (19) **Q** On any of the counters you ve worked on in the various
 (20) rivers in Alaska have you ever observed a situation where the
 (21) counter was not able to keep up with the number of fish that
 (22) were passing?
 (23) **A** No
 (24) **MS STEWART** Your Honor that concludes defendants
 (25) direct

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- (1) **MS WAGNER** We have a very short cross Your Honor
 (2) **THE COURT** Go ahead
 (3) **CROSS EXAMINATION OF AL MENIN (Video)**
 (4) **BY VIDEO EXAMINER**
 (5) **Q** Can you tell me about any training that you had any
 (6) educational training that you had in sonar or sonar - sonar
 (7) engineering?
 (8) **A** The - I took one sonar class at UCLA and the rest
 (9) basically rubbed off on me since I - I m surrounded by sonar
 (10) engineers at Bendix
 (11) **Q** The class you took at UCLA was that just a basic sonar
 (12) class?
 (13) **A** It was a little bit more advanced than basic I ve read a
 (14) few books on sonar
 (15) **Q** Do you consider yourself an expert in sonar?
 (16) **A** No
 (17) **Q** I want to talk for a minute about the different parts of a
 (18) sonar counter the side scan sonar counter As I understand
 (19) there s the sonar portion which is the transducer is that
 (20) right?
 (21) **A** Yes
 (22) **Q** And did you have anything to do with inventing that?
 (23) **A** No
 (24) **Q** Has - have there been any changes made to the transducers
 (25) that are used in the side scanner that you know of in the last

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- (1) five years?
 (2) **A** None
 (3) **Q** Have there been any changes made in let s say the last 10
 (4) years?
 (5) **A** None
 (6) **Q** Let s start with you Have you done any testing of the
 (7) transducers in the last 10 years?
 (8) **A** No not I
 (9) **Q** Would you consider yourself an expert in that kind of
 (10) testing?
 (11) **A** No
 (12) **Q** So your invention on the side scanner essentially goes to
 (13) the part of the counter that takes whatever information comes
 (14) off the transducer and counts it, isn t that right?
 (15) **A** Correct
 (16) **Q** And your invention doesn t look at what s in the water
 (17) column except to the extent that it s been translated or
 (18) reported through the transducer, is that -
 (19) **A** Correct
 (20) **Q** I d like to focus on what you do in terms of looking at the
 (21) counter and making sure that to the best of your
 (22) understanding it s working properly What do you do when
 (23) you
 (24) get - let s go to the Kenai River What do you do when you
 (25) take a look at the counter?
 (26) **A** Okay Number one I put in a simulated electronic salmon

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- (1) signal
 (2) **Q** And what s that?
 (3) **A** It s - it s a tiny signal that represents an echo from a
 (4) small salmon And I put it in at 3 7 feet and 53 feet and
 (5) inject it electronically and verify that it s counting them all
 (6) the time And number - now -
 (7) **Q** I just want to -
 (8) **A** Yeah
 (9) **Q** So what you re doing is you re creating you re simulating
 (10) what the echo of a salmon would look like on an electronic
 (11) device?
 (12) **A** Right uh huh
 (13) **Q** And you do that so that it would be simulating a salmon at
 (14) 3 7 feet out from the transducer and at -
 (15) **A** Right
 (16) **Q** - 53 feet out from the transducer?
 (17) **A** Uh huh
 (18) **Q** You verify that one electronic salmon that you ve created
 (19) is counted on the counter?
 (20) **A** Yes
 (21) **Q** And that s really a test just of the counter in other
 (22) words it doesn t have anything to do with the transducer?
 (23) **A** True
 (24) **Q** For any of these let s call them tests that occurred on
 (25) either the Crescent the Nushagak or the Naknek when the

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11 river cleared up and you were able to do some sort of
 12 comparison do you know whether or not any of these were
 13 documented that is are they written down anywhere are they
 14 published anywhere do you have copies in your documents on
 15 them?
 16 A I don't I don't know if anything was published I
 17 suspect not because it happened for such a short period of
 18 time
 19 Q Is there any way that you know of to document each and
 20 every test that has been done on a particular counter each
 21 year?
 22 A No
 23 MS WAGNER That concludes the cross Your Honor
 24 MS STEWART Your Honor before we continue to the
 25 next witness we have a rather extensive list of exhibits
 26 defendants would like to offer into evidence and which we
 27 believe plaintiffs have no objection
 28 DX1796 DX1799 DX1848 DX1849 DX1850 DX1867 Alpha
 29 DX1871 DX1878 Alpha DX1880 Alpha DX1882 Baker
 30 DX1895
 31 DX1925 DX1926 DX1940 DX1941 DX2389 DX3286 DX3288
 32 DX3289
 33 DX3292 DX3293 DX3310 DX3315 DX3327 DX3328 DX3330
 34 DX3331
 35 DX3334 DX3336 DX3337 DX3339 DX3554 DX3826 DX4030
 36 DX4652 DX4662 DX4668 Alpha DX4669 DX4798
 37 DX4855 Alpha
 38 DX5034 DX5037 DX5038 DX5042 DX5184 Baker
 39 DX5185 Baker
 40 DX5186 DX5187 DX5189 DX5251 DX5256 DX5335 DX5337
 41 DX5339

DX5374

(22) DX5384 DX25385 DX5386 DX5394 DX5420 DX5421 DX5441
 (23) DX5442 DX5443 DX5471 DX5476 Baker DX5477 Baker
 (24) DX5478 Baker DX5479 Baker DX5503 DX5504 DX5508
 DX5509
 (25) DX5516 DX5517 DX5518 DX5519 DX5599 DX5603 Alpha
 DX5622

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(1) DX5341 DX5345 DX5361 DX5362 DX5366 DX5374 DX5384
 (2) DX25385 DX5386 DX5394 DX5420 DX5421 DX5441 DX5442
 (3) DX5443 DX5471 DX5476 Baker DX5477 Baker
 DX5478 Baker
 (4) DX5479 Baker DX5503 DX5504 DX5508 DX5509 DX5516
 DX5517
 (5) DX5518 DX5519 DX5599 DX5603 Alpha DX5622 DX5704
 DX5795
 (6) DX5802 DX5842 DX5843 DX5844 DX6788 DX6863 DX6864
 DX6865
 (7) DX6871 DX7113 DX7124 Alpha DX7427 Alpha DX8410
 DX8411
 (8) DX8412 DX8416 DX8421 DX8600 DX8676 Baker
 DX8677 Baker
 (9) DX8678 Alpha DX8686 Alpha DX8687 Alpha DX8691
 DX8695 Alpha
 (10) DX8755 DX8761 DX8771 DX8783 DX8784 DX8789 Alpha
 (11) DX8790 Alpha DX8795 DX8798 DX8803 Alpha
 DX8807 Alpha
 (12) DX8809 DX9271 DX92272 and PX0379 and PX0398
 (13) (Exhibits DX1796 DX1799 DX1848 DX1849 DX1850
 (14) DX1867 Alpha DX1871 DX1878 Alpha DX1880 Alpha
 DX1882 Baker
 (15) DX1895 DX1925 DX1926 DX1940 DX1941 DX2389 DX3286
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 DX5184 Baker
 (20) DX5185 Baker DX5186 DX5187 DX5189 DX5251 DX5256
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 (21) DX5337 DX5339 DX5341 DX5345 DX5361 DX5362 DX5366

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- (1) DX5704 DX5795 DX5802 DX5842 DX5843 DX5844 DX6788 DX6863
 - (2) DX6864 DX6865 DX6871 DX7113 DX7124 Alpha DX7427 Alpha
 - (3) DX8410 DX8411 DX8412 DX8416 DX8421 DX8600 DX8676 Baker
 - (4) DX8677 Baker DX8678 Alpha DX8686 Alpha DX8687 Alpha DX8691
 - (5) DX8695 Alpha DX8755 DX8761 DX8771 DX8783 DX8784
 - (6) DX8789 Alpha DX8790 Alpha DX8795 DX8798 DX8803 Alpha
 - (7) DX8807 Alpha DX8809 DX9271 DX92272 and PX0379 and PX0398
 - (8) offered)
 - (9) MR SCHROER No objection on any of those Your
 - (10) Honor
 - (11) THE COURT They are all admitted
 - (12) (Exhibits DX1796 DX1799 DX1848 DX1849 DX1850
 - (13) DX1867 Alpha DX1871 DX1878 Alpha DX1880 Alpha DX1882 Baker
 - (14) DX1895 DX1925 DX1926 DX1940 DX1941 DX2389 DX3286 DX3288
 - (15) DX3289 DX3292 DX3293 DX3310 DX3315 DX3327 DX3328 DX3330
 - (16) DX3331 DX3334 DX3336 DX3337 DX3339 DX3554 DX3826
 - (17) DX4030 DX4652 DX4662 DX4668 Alpha DX4669 DX4798
 - (18) DX4855 Alpha DX5034 DX5037 DX5038 DX5042 DX5184 Baker
 - (19) DX5185 Baker DX5186 DX5187 DX5189 DX5251 DX5256 DX5335
 - (20) DX5337 DX5339 DX5341 DX5345 DX5361 DX5362 DX5366 DX5374
 - (21) DX5384 DX25385 DX5386 DX5394 DX5420 DX5421 DX5441
 - (22) DX5442 DX5443 DX5471 DX5476 Baker DX5477 Baker
 - ~~(23) DX5478 Baker DX5479 Baker DX5503 DX5504 DX5508~~
- Vol 33 5920
- (1) DX5509
 - (1) DX5864 DX6865 DX6871 DX7113 DX7124 Alpha DX7427 Alpha
 - (2) DX8410 DX8411 DX8412 DX8416 DX8421 DX8600 DX6788 DX8676 Baker
 - (3) DX8677 Baker DX8678 Alpha DX8686 Alpha DX8687 Alpha DX8691
 - (4) DX8695 Alpha DX8755 DX8761 DX8771 DX8783 DX8784
 - (5) DX8789 Alpha DX8790 Alpha DX8795 DX8798 DX8803 Alpha
 - (6) DX8807 Alpha DX8809 DX9271 DX92272 and PX0379 and PX0398
 - (7) received)
 - (8) MS STEWART Defendants would like to call Larry
 - (9) Nicholson to the stand by read deposition testimony
 - (10) THE CLERK Would you raise your right hand please
 - (11) sir?
 - (12) (The Witness Is Sworn)
 - (13) THE CLERK Please be seated For the record sir
 - (14) state your full name your address and spell your last name
 - (15) THE WITNESS Yes I am Donald K Ford You need my
 - (16) address? That s 605 West 2nd Suite 201 Anchorage Alaska
 - (17) 99501
 - (18) THE CLERK Spell your last name
 - (19) THE WITNESS Oh F O R D
 - (20) DIRECT EXAMINATION OF LARRY NICHOLSON (Read)
 - (21) BY MS STEWART
 - (22) Q Mr Nicholson could you state for the record your address
 - (23) please?
 - (24) A My home address is 515 Mozart Circle Kodiak
 - (25) Q What is your educational background?

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- (1) A I have a bachelor s of science in wildlife management from
- (2) University of Humboldt northern California
- (3) Q When did you first come to Alaska?
- (4) A 1965
- (5) Q How does that relate to when you received your bachelor s
- (6) degree?
- (7) A Oh I didn t receive my bachelor s until the end of my four
- (8) years in the military which would have been in 72 or 73
- (9) Q Did you then come to Alaska permanently after you
- (10) graduated?
- (11) A Yes within about six to eight months
- (12) Q What employment have you had since that time?
- (13) A I have worked for the department ever since
- (14) Q Could you tell me what positions you have held and which
- (15) years?
- (16) A I might be able to Let s see Initially in, I believe
- (17) it was 73 74 I worked for Shellfish Research in Kodiak
- (18) primarily on a shrimp program Then 75 through about 81
- (19) approximately I was a Chignik area management biologist for
- (20) salmon Then I jumped ship and moved to Kodiak - or excuse
- (21) me to Juneau for about a year and a half and worked for our
- (22) game division Then in 84 I took this current position as
- (23) regional supervisor in Kodiak and I have been there ever
- (24) since for commercial fish
- (25) Q I would like to turn back to the spring and summer of 1989

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- (1) subsequent to the Exxon Valdez oil spill Were there concerns
- (2) in the westward region about the possibility of overescapement
- (3) on the sockeye spawning streams in the westward region area?
- (4) A Yes
- (5) Q Do you - do you recall which streams specifically you were
- (6) concerned about?
- (7) A Well any of the major sockeye systems I can name most of
- (8) those
- (9) Q Well I ve seen documentation indicating that there were
- (10) concerns about the Ayakulik or Red River specifically and
- (11) also the Akalura River Do you recall that there were others
- (12) there were concerns about?
- (13) A Yes we were concerned for all of them
- (14) Q After the 1989 season was over and the escapement
- (15) numbers
- (16) were in were there any specific streams that you had had
- (17) concerns about?
- (18) A Well two in particular we put too many fish out Red
- (19) River - or Red Lake Red River complex Akalura That s one
- (20) system The other one was Akalura
- (21) Q Akalura?
- (22) A I m sorry Akalura was one of the lake systems The other
- (23) was the Red Lake system which has two streams off of it the
- (24) Ayakulik and the Red River
- (25) Q In the spring before the salmon season - well do you
- (26) recall that these concerns were expressed in April and May of

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- 1) that year?
 A Yes they were We as a staff had discussed those
 3) concerns
 4) Q Do you recall discussing the possibility of taking steps to
 5) limit the escapement on some of the sockeye streams?
 6) A Yes
 7) Q And what particular methods did you talk about possibly
 8) doing?
 9) A Well it was certainly system dependent For instance
 10) within the Red River system the lagoon itself was a very small
 11) lagoon It s subject to tidal influence and it also is necked
 12) down at the mouth to the point where you couldn t get a seiner
 13) in that particular lagoon So the only gear type you could
 14) move in which is currently not a legal gear type under the
 15) existing plan would be the setnets and/or beach seine So
 16) that was the alternative for that system
 17) Q Did you discuss at all doing something at the weir that
 18) is collecting the salmon at the weir and bringing them out
 19) there a departmental activity?
 20) A That would have been part and parcel to allowing gear type
 21) to go in and remove them from the lagoon itself You would
 22) shut the weir off back the fish up harvest them within that
 23) lagoon
 24) Q But you don t recall a discussion of departmental personnel
 25) actually harvesting the fish at the weir and then transporting

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- (1) them out of that location?
 (2) A Yes we did talk about that too
 (3) Q Oh okay Did you talk about any other possible ways of
 4) dealing with potential overescapement?
 (5) A No Those two methods would be the only ones we would
 have
 6) considered
 (7) Q Did you discuss possible ways of dealing with the potential
 8) overescapement with anyone outside of the westward region?
 (9) A Yes we had conversation throughout the course of the
 10) season with industry
 (11) Q Processors?
 (12) A And fishermen
 (13) Q What were you trying to learn or what was the nature of
 (14) that discussion?
 (15) A Just looking at our options
 (16) Q Do you recall discussing your options with anybody at the
 (17) headquarters office of ADF&G in Juneau?
 (18) A Yes I am sure I talked to the director at the time Ken
 (19) Parker
 (20) Q What was the decision in terms of trying to do some special
 (21) harvest arrangements with respect to potential
 overescapement?
 (22) A Well for Red River if we re still on that topic -
 (23) Q Yes I m talking about Red River
 (24) A It was predicated on the appreciable likelihood that we
 (25) were going to encounter any oil within that lagoon and we might

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- (1) consider a mop up type approach but the problem there is we
 -
 (2) we continued to have oil showing up at the mouth and as I said
 (3) earlier we had tidal influence all the way up through that
 (4) lagoon area We just felt it probably wasn t safe to try to do
 (5) it
 (6) Q So you concluded that you couldn t safely put in setnetters
 (7) or beach seiners at that location
 (8) A That s right
 (9) Q What about the objection o arvesting at the weir what
 (10) was the final decision on that?
 (11) A Well the weir itself you would have to back down
 (12) approximately 200 yards from the weir to harvest the fish
 (13) Behind the weir is simply too shallow We are talking about on
 (14) most situations excluding flood conditions your water level is
 (15) a foot or less
 (16) Q So how did that affect the decision the fact that you have
 (17) to back down 200 yards? Maybe I need to know how close is
 the
 (18) weir to the river mouth?
 (19) A The weir itself from the lagoon is I m estimating maybe
 (20) 300 to 400 yards Then the lagoon itself to the mouth then
 (21) empties into the ocean is only about 1500 yards and about 20
 (22) yards wide
 (23) Q How did those physical attributes of that location affect
 (24) your decision to try to do some sort of a special harvest
 (25) there?

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- (1) A The schooling fish tended to build up within the lagoon
 (2) There were fish also in that very shallow component the 400
 (3) yards below the weir that you couldn t fish in As I stated
 (4) earlier the lagoon itself was subject to intertidal
 (5) involvement and we were concerned about oil moving in and
 out
 (6) of that area in that it was showing up routinely at the mouth
 (7) Q Would it have been possible to do some sort of inriver
 (8) fishery using department boats as opposed to a commercial
 (9) endeavor?
 (10) A You could have attempted something like that but I think
 (11) it would have been relatively ineffective
 (12) Q Why is that?
 (13) A Because the water is so shallow if you threw a gillnet in
 (14) there the lower meshes would be the only effective meshes
 (15) Those would fill up real quick and all other fish would just
 (16) pass right over the gear
 (17) Q Do you recall any particular point in the season when you
 (18) decided you just weren t going to try to do it?
 (19) A When the runs were over
 (20) Q I have seen some numbers and we can look at the
 documents
 (21) later but the escapement on the Red River in 1989 was
 (22) approximately 760 000 is that right?
 (23) A I think that s right
 (24) Q In any event do you recall what the run came - that the
 (25) run came in smaller than forecast - in smaller than forecast

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- (1) on the Red River in 1989?
- (2) A Yes I remember that the total run forecast is somewhere
- (3) in the neighborhood of close to a million
- (4) Q Any others that you ve looked at?
- (5) A The only one that we routinely do smolt work on is Fraser
- (6) Q Have you seen any problem on the Fraser arising from
- (7) escapement in 1989?
- (8) A No We didn t overescape
- (9) Q So am I correct that the Red River is the only one that you
- (10) are continuing to monitor for a potential overescapement
- (11) problem?
- (12) A That s correct
- (13) Q Now these discussions you had about potentially using
- (14) some special measures with respect to overescapement in 1989
- (15) those went on within the department is that right?
- (16) A Yes
- (17) Q Was Exxon privy to those discussions any Exxon personnel?
- (18) A No
- (19) Q Well then those fish were processed in Kodiak either
- (20) canned or frozen and distributed to various towns and villages
- (21) in the Kodiak area?
- (22) A That s correct
- (23) Q Mr Nicholson do you recall a term or a policy known as
- (24) the zero tolerance policy as applied to the spill related
- (25) closures in the Kodiak area in 1989?

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- (1) A Yes
- (2) Q What was that?
- (3) A We just weren t going do allow fishery to occur if we
- (4) thought there was any likelihood that they would encounter
- (5) oil Zero tolerance specifically was we weren t going to allow
- (6) any fish to enter the marketplace contaminated so we were
- (7) going to take every measure possible to prevent that
- (8) Q Would you describe that as a relatively tough policy?
- (9) A A very conservative policy
- (10) Q Was there any oiling of gear of commercial fishermen during
- (11) commercial openings in the westward region in 1989?
- (12) A Not that I know of
- (13) Q And were any oiled fish actually landed in the commercial
- (14) openings in the westward region in 1989 to your knowledge?
- (15) A Not that I m aware of
- (16) Q Were you successful in preventing any oiled seafood product
- (17) from reaching processors that year?
- (18) A Yes
- (19) Q Do you attribute that success to the zero tolerance policy?
- (20) A Yes
- (21) Q Do you recall there being any differences of opinion within
- (22) the management staff as to whether or not openings should
- (23) occur in areas within the westward region?
- (24) A Yes
- (25) Q Could you describe those for me?

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- (1) A Yes There was at least a discussion among staff to how
- (2) conservative we had to be and still ensure the zero tolerance
- (3) policy and attitudes varied from individual by individual
- (4) Q And Mr Probasco testified in his deposition that there was
- (5) some difference of opinion with respect to the Olga Moser Bay
- (6) area and in particular that Larry Malloy thought that area
- (7) should not be opened and Mr Probasco and others thought it
- (8) should be opened Do you recall that issue at all?
- (9) A Now you jogged my memory I do remember those
- (10) discussions
- (11) Q Is that generally an accurate description of what happened?
- (12) A Yes I think it is
- (13) Q The ultimate decision was to open the Olga Moser Bay for at
- (14) least the Alitak district for setnet fishing is that right?
- (15) A That s correct
- (16) Q Did you agree with that position?
- (17) A I approved it
- (18) Q Do you recall that Mr Malloy was opposed to that?
- (19) A Yes
- (20) Q Do you remember why?
- (21) A Yes I do It had more to do with not actually following
- (22) to the letter the management plan that was adopted for that
- (23) area by the board and nothing to do with the fact that the
- (24) fish was subject to potential - potential contamination
- (25) Q So he did not believe that there was a risk of potential

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- (1) A No It was a violation of the plan
- (2) Q In what respect was it a violation of the plan?
- (3) A The plan is predicated on trying to distribute fishing time
- (4) among all users which includes the seine fleet and the areas
- (5) that the seine fleet is subject to fishing was inundated with
- (6) oil so we could only allow the setnetters to fish and shut the
- (7) seiners off
- (8) Q So his objection was that it wasn t fair under the plan to
- (9) the seiners because they couldn t fish whereas the setnetters
- (10) could?
- (11) A That s correct
- (12) Q And did the setnetters in fact have a very successful
- (13) season that year because they were - they were the only gear
- (14) type that could fish?
- (15) A They had a very successful season not because they were
- (16) the only gear type that did fish
- (17) Q Why was it a very successful season?
- (18) A If both gear types would have been allowed to fish they
- (19) probably both would have had a successful season
- (20) Q Is that because the runs were strong?
- (21) A Yes
- (22) Q Were you the person that ultimately decided whether or not
- (23) commercial fisheries in the westward region would be opened
- (24) or closed?
- (25) A Yes

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- (1) Q Going back to the Kodiak management area now there were
 (2) there was overescapement in the pink salmon runs in 1989 was
 (3) there not?
 (4) A That s correct
 (5) Q Do you know whether or not there was any long term impact
 (6) on the Kodiak pink runs as a result of those overescapements?
 (7) A No
 (8) Q You don t know or there was not?
 (9) A There was not And I would like for you to be more
 (10) specific with your question What do you mean long term
 (11) effects? I mean we are talking about a different cycle of
 (12) fish altogether here
 (13) Q Right A pink is a two-year cycle correct?
 (14) A That s correct
 (15) Q And so you have observed the returns in 90 and 91 in the
 (16) pink fisheries in Kodiak?
 (17) A That s correct
 (18) Q And based on those observations it does not appear there
 (19) is any impact from the 89 overescapement is that correct?
 (20) A That s right
 (21) Q And the only area where the department is studying a
 (22) potential long term impact in the sockeye returns in the
 (23) westward management region is the Red River is that correct?
 (24) A Correct
 (25) Q Have you ever fished commercially yourself?

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- (1) A Yes
 (2) Q And could you tell me when and where?
 (3) A I assisted a commercial operation back in I think it was
 (4) 65 Bristol Bay setnet fishery one summer with Jay Hammond
 (5) and his family
 (6) Q And in a typical year how much time do you spend out area
 (7) offices?
 (8) A A typical year a couple weeks
 (9) Q Where do you go? Do you go to Chignik?
 (10) A Chignik Sand Point Cold Bay Port Moller
 (11) Q What involvement do you have in the sorts of day to day
 (12) management activities in those areas?
 (13) A I require that any of the major decisions concerning the
 (14) allocation of a given fishery when we reach the critical
 (15) points in the management plan that the issues be reviewed by
 (16) me and Mr Probasco Most of the time that s done over the
 (17) telephone
 (18) Q You talked about major decisions on allocation under the
 (19) management plans Could you give me an example of what
 (20) those are in the Chignik area?
 (21) A There are two examples There is a Stepovak interception
 (22) fishery and then on the other end is an Igvak We have an
 (23) allocated set of the Chignik total run that s allocated to
 (24) those two areas and the review that I require when we get down
 (25) to deciding on where we are as far as a percentage in the

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- (1) current escapement level at that time the potential impact of
 (2) having another period in those areas and what that impact
 (3) might
 (4) be as far as jeopardizing or potentially jeopardizing our
 (5) escapement so I like to look at all the numbers and finalize
 (6) our decision
 (7) Q And those interception fisheries are you in charge of both
 (8) ends of the interception right?
 (9) A That s correct
 (10) Q Are you the person who gets to make the final call or
 (11) maybe I should say has to make the final call on when openings
 (12) will occur in those interception fisheries?
 (13) A I am the guy that ultimately takes the responsibility if
 (14) the final call is not correct so I do review those
 (15) Q On the Stepovak interception fishery who decides if the
 (16) Sand Point people are going to be able to fish at the initial
 (17) level? Is it Mr Shaul or the person in Chignik or you?
 (18) A At Stepovak right now it s a combination of the area
 (19) manager that s based in Sand Point The name is Jim
 (20) McCullough and the management biologist in Chignik which is
 (21) Al Quinley Pete Probasco and myself
 (22) Q So all four of you have input into that?
 (23) A Yes
 (24) Q Do you recall in 1989 your staff taking a look at the
 (25) question whether or not oil spill closures impacted the
 Stepovak interception fishery?

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- (1) A Yes
 (2) Q Do you recall Mr Barrett concluding that there was no
 (3) impact on the interception fishery from oil closures?
 (4) A I do
 (5) Q Turning to a different subject in any year have you heard
 (6) of any claims that you were under that is the department was
 (7) underestimating the herring biomass in the Kodiak area?
 (8) A Yes
 (9) Q Do you think there is any validity to those claims?
 (10) A Yes
 (11) Q Could you describe for me what you mean?
 (12) A Well I think that again assessment ability is certainly
 (13) not an exacting science whether you are talking about aerial
 (14) assessment or sonar and I think we have probably
 (15) overestimated
 (16) on some years and underestimated on others But I think the
 (17) one thing to keep in mind is that we still have healthy stocks
 (18) so whether we have overestimated on any given year in any
 (19) given
 (20) bay I think we ve perpetuated that resource They have
 (21) continually improved over the last few years so whatever we
 (22) are doing I think we are probably doing the right thing
 (23) Q So it s your opinion that there may be years when you were
 (24) high or low?
 (25) A Yes
 (26) Q Or in between?
 (27) A Yes

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- (1) Q Do you know of any chronic bias in the way that you
 (2) estimate that would cause it to be consistently high or
 (3) consistently low?
 (4) A No
 (5) Q Is there any reason why the department would try to make it
 (6) either high or low? Would that accomplish anything?
 (7) A No
 (8) Q Is the same true of counting that is aerial counting or
 (9) sonar counting?
 (10) A That's true there is no reason why we would to fudge it
 (11) Q Regarding the Red River system the total escapement goal
 (12) for that system is 200 000 to 300 000 What was the goal when
 (13) you took over in 1984 - I'm sorry was that the goal when you
 (14) took over in 1984?
 (15) A It was
 (16) Q Has it been the same since?
 (17) A Yes
 (18) Q Do you know if there has ever been consideration made to
 (19) changing that?
 (20) A Yes there has We have talked about that for the last few
 (21) years but there has been no change made to date
 (22) Q I'm going to refer you to what's been marked as DX5802 and
 (23) it's a January 10 1989 memo from Doug Pengilly to Bruce
 (24) Barrett Do you recall seeing this memo on or about January of
 (25) 1989?

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- (1) A No I don't remember
 (2) Q Do you recall that at or about that time there was a
 (3) discussion about the possibility of changing the escapement
 (4) goal on the Red River?
 (5) A I do
 (6) Q Why don't you tell - first tell me what you recall about
 (7) that discussion
 (8) A It was brought to my attention by Bruce Barrett that the
 (9) subject of the escapement requirements for Red Lake in
 (10) particular was one that he felt we probably should sit down and
 (11) take a look at So in preparation for that meeting he had
 (12) asked Doug to run some analysis on that and we as a staff did
 (13) sit down and go through all of this That's about all I can
 (14) tell you
 (15) Q Do you recall what conclusion was reached if any about
 (16) that?
 (17) A Well we basically didn't make a change We did not
 (18) change
 (19) Q Do you recall why?
 (20) A We really didn't feel that the data we had was conclusive
 (21) Q Over on the second page of that exhibit which were looking
 (22) at during your deposition Mr Pengilly says quote does the
 (23) data indicate that the return depends upon escapement level?
 (24) Despite all the noise in the data due to unknown factors for
 (25) example environment and competition between generations
 it's

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- (1) clear that returns increase with increasing escapement in this
 (2) data the trend is statistically significantly Do you recall
 (3) that this was his analysis?
 (4) A Yes Yes
 (5) Q Did you agree with that?
 (6) A Basically no I didn't agree with it or we probably would
 (7) have upped the escapement
 (8) Q Do you recall - you said you didn't feel the data was
 (9) conclusive What was it about the data that you felt you
 (10) needed more information on?
 (11) A I think we simply needed more data points
 (12) Q Down at the bottom of this page that you were looking at in
 (13) your deposition in the next to the last sentence Mr Pengilly
 (14) says quote with the data that we presently have we cannot
 (15) set an optimal escapement goal with any certainty the data
 (16) shows increasing return with increasing escapement and does
 (17) not
 (18) indicate that the optimal escapement level has been reached
 (19) close quote
 (20) Focusing on just that first clause in that first sentence
 (21) that quote we cannot set an escapement goal with any
 (22) certainties close quote did you agree with that at that time?
 (23) A I did
 (24) Q And in the last sentence he says quote if it is desired
 (25) to set escapement goals to optimize return less escapement we
 need a wider range of data values to understand the stock

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- (1) recruit relationship so that an optimal escapement can be
 (2) identified close quote Did you agree with that statement?
 (3) A More or less
 (4) Q Do you recall that there was a year on the Red River when
 (5) the escapement was approximately 775 000 in 1980?
 (6) A I do
 (7) Q In 1989 did you have an opinion as to whether or not you
 (8) Mr Nicholson in the westward region really knew what the
 (9) optimum or maximum escapement was for your sockeye
 (10) system?
 (11) A No and I don't think I know that precisely today And I
 (12) don't know that we ever will precisely
 (13) Q Well confidence in spawner recruits small euphotic
 (14) volume and other theoretical means are all those variables
 (15) that you need to know about in order to assess that?
 (16) A Yes
 (17) Q And as time passes you refine that is that fair?
 (18) A Yes And certainly the adult mortality that's suffered
 (19) is - that's totally unmeasured in high seas that can be a
 (20) real factor that we will never have a grasp on We know the
 (21) 200 mile limit certainly had some impact on that but there is
 (22) a lot of different types of gear offshore and various fisheries
 (23) that subject themselves to bycatch of salmon and the
 (24) recording
 (25) of those bycatches are not as good as they should be so -
 Q Are there other factors relating to optimum escapement that
 you really don't know a lot about?

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- (1) A These are the big ones and I shouldn't say we don't know a
 (2) lot about it I think we know quite a bit about each of those
 (3) components but do we know everything and do we have it
 down to
 (4) the bottom line on optimum and maximum no we don't
 (5) Q Well then focusing on particular marine survival that is
 (6) what happens to sockeye after they leave the freshwater
 (7) environment are there a lot of unknowns with respect to that
 (8) phase of their life cycle?
 (9) A There are
 (10) Q We talked earlier about the 1989 season and the closure
 (11) decisions I want to follow up and ask you about 1990 Were
 (12) there any Valdez spill related fishing closures in your region
 (13) during the 1990 season commercial fisheries?
 (14) A As I recall there was no closures
 (15) Q Okay And we talked a little bit earlier about the Red
 (16) River You explained that in your view it would have been hard
 (17) to have a fishery there because of the shallowness of the water
 (18) and how close the weir is to the ocean?
 (19) A Right
 (20) Q And you talked about tidal influence and so on I wanted
 (21) to ask you a follow up question If in fact you received
 (22) instructions from Juneau ADF&G in Juneau in 1989 from
 (23) commercial fisheries headquarters to limit the escapement in
 (24) that river to a fixed number say 300 000 or 400 000 are
 (25) there ways physically you could have done that?

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- (1) A Yes
 (2) Q How would you have done that?
 (3) A We would have simply tried to close the weir off entirely
 (4) and the fish would have simply died behind the weir
 (5) Q Mr Probasco I asked him that question in his deposition
 (6) and he said that if you had the money and the manpower you
 (7) could have conceivably netted the fish and helicoptered them to
 (8) Kodiak for processing You think that would be feasible?
 (9) A Oh it's possible
 (10) MS STEWART Thank you
 (11) MS WAGNER I'll wait for the cross until after the
 (12) break
 (13) THE COURT We'll take our recess at this time ladies
 (14) and gentlemen We'll be in recess for 15 minutes
 (15) (Jury out at 12 02 p m)
 (16) (Recess from 12 02 p m to 12 17 p m)
 (17) (Jury in at 12 17 p m)
 (18) MS WAGNER Thank you Your Honor
 (19) CROSS EXAMINATION OF LARRY NICHOLSON (Read)
 (20) BY MS WAGNER
 (21) Q Ready?
 (22) A I am
 (23) Q What was the decision in terms of trying to do some special
 (24) harvest arrangements with respect to potential
 overescapement?
 (25) A Well for Red River - if we're still on that topic?

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- (1) Q Yes I'm talking about the Red River
 (2) A It was predicated on the appreciable likelihood that we
 (3) were going to encounter any oil within that lagoon and we might
 (4) consider a mop up type approach But the problem there is
 that
 (5) we continued to have oil showing up at the mouth and as I said
 (6) earlier we had tidal influence all the way up through that
 (7) lagoon area We just felt it probably wasn't safe to try to do
 (8) it
 (9) Q Would it have been possible to do some sort of inriver
 (10) fishery using department boats as opposed to a commercial
 (11) endeavor?
 (12) A You could have attempted something like that but I think
 (13) it would have been relatively ineffective
 (14) Q Why is that?
 (15) A Because the water is so shallow if you threw a gillnet in
 (16) there the lower meshes would be the only effective meshes
 (17) Those would fill up real quick and all the other fish would
 (18) just pass right over the gear
 (19) Q In 1989 the oil had some very significant impacts on the
 (20) Chignik area did it not?
 (21) A It did
 (22) Q What happened in part was that the cape areas were closed
 (23) off because of oil?
 (24) A That's correct
 (25) Q And the cape fleet then were pushed into the lagoon to

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- (1) fish?
 (2) A That's correct
 (3) Q And not only were areas closed off but at some point
 (4) during the season fishing was limited to daylight hours?
 (5) A That's right
 (6) Q And that's because you wanted to be able to have the
 (7) fishermen see and avoid oil?
 (8) A That's correct
 (9) Q Now Mr Probasco testified that it was his opinion that
 (10) the closures of the cape and the other restrictions due to oil
 (11) caused Chignik fishermen to lose catch Would you agree with
 (12) that assessment?
 (13) A Yes I do agree with that We found with maximizing the
 (14) fishing effort in the lagoon with an extremely strong run you
 (15) are still going to have fish escape harvest So by allowing a
 (16) fishery in those outside capes you are obviously slowing that
 (17) run down before it accumulates within the lagoon itself prior
 (18) to running the river
 (19) Q And one of the things that happens in the normal way the
 (20) fishery is conducted - not in 1989 You have the cape fleet
 (21) out there They're catching the Chignik bound fish earlier
 (22) than if they were in the lagoon I take it?
 (23) A That's correct
 (24) Q And Mr Probasco said that the travel time for fish from
 (25) the cape areas outer cape areas or inner cape areas for that

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- (1) matter to the lagoon can be anywhere from two to ten days
 (2) Would you agree with that assessment?
 (3) A Yes
 (4) Q Now the cape fleet they are targeting Chignik bound fish
 (5) aren't they?
 (6) A They are
 (7) Q But in fact they will catch some non Chignik bound fish
 (8) won't they?
 (9) A That's correct
 (10) Q When you are fishing in the lagoon you are catching not
 (11) only predominantly but probably only Chignik fish is that a
 (12) fair statement?
 (13) A A better word is predominate We have in fact found a few
 (14) stray stocks very few A case in point we've had fish that
 (15) were tagged in other locations that were recovered in Chignik
 (16) Lagoon This is a rarity If we were going to look at
 (17) percentages we're probably looking at less than one tenth of
 (18) one percent something of that magnitude but it does happen
 (19) Q But having non Chignik fish in the lagoon that would be a
 (20) fluke sort of thing?
 (21) A Yes it would
 (22) Q Now escapement for the Chignik fishery it is done on a
 (23) kind of an interval goal system is it?
 (24) A Yes
 (25) Q In other words you don't wait for your 400 000 goal in the

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- (1) early run rather you get so many escaped fish by a certain
 (2) date and then you have different dates pegged is that how it
 (3) works?
 (4) A Yes This is referred to as a time of entry table The
 (5) rationale is that you will segment your escapement throughout
 (6) the entire length of that run instead of taking a big chunk out
 (7) of only one portion of the run Again the reason we do that
 (8) is because we have discreet stocks of fish within a given run
 (9) that actually spawn in separate areas So if you want to make
 (10) sure you adequately cover all the spawning grounds you will
 (11) systematically want to take those fish escapement throughout
 (12) the entire lengths so you segment it out
 (13) We have a table that we publish annually for the early and
 (14) late run and it gives the desired over time for each date
 (15) Q One statement you made yesterday you were talking about
 (16) 18 million spawners in 1989 getting into the Kodiak system which
 (17) was more designed for 3 million spawners?
 (18) A That's correct
 (19) Q Do you remember that? In your assessment what kind of
 (20) impact does that have when you have that many more
 (21) spawners?
 (22) A One of the concerns that we had was when you put that many
 (23) fish in the spawning beds themselves whether or not you are
 (24) going to suffer a real problem as far as depleted dissolved
 (25) oxygen and would that in fact kill a lot of those fish prior to
 them having the ability to spawn

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- (1) We really didn't find a relationship What happens is that
 (2) when you have spawning on top of spawning they tend to go in
 (3) and dig the redd and the eggs out that have already been
 (4) deposited so you finally reach a saturation point for a given
 (5) system That's basically what we saw in quite a few of the
 (6) systems to Kodiak
 (7) No we really didn't measure any of the quote negative
 (8) effect The pink salmon are unique in that they do not require
 (9) the system itself to support them during that life cycle In
 (10) other words they emerge in the spring the spring after they
 (11) spawn They immediately migrate out to the estuaries so they
 (12) are not relying on those streams to support them unlike
 (13) sockeye
 (14) Sockeye will rely on the lake systems for at least one or
 (15) two years of life so that lake has to be able to support that
 (16) volume of fish An example is if all 18 million of those fish
 (17) were sockeye and they were within sockeye systems it would
 (18) be
 (19) a real problem They would basically eat themselves out of
 (20) house and home Not the case with either pink or chum
 (21) salmon
 (22) MS WAGNER That concludes the cross Thank you
 (23) MS STEWART Your Honor defendants call Kenneth
 (24) Florey to the stand by read deposition testimony
 (25) THE CLERK Would you raise your right hand please
 sir
 (The Witness Is Sworn)

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- (1) THE CLERK Please be seated For the record sir
 (2) state your full name your address and spell your last name
 (3) please
 (4) THE WITNESS My name is James N Reeves My address
 (5) is 4001 Westwood Drive Anchorage Alaska
 (6) THE CLERK Spell your last name
 (7) THE WITNESS R E E V E S
 (8) DIRECT EXAMINATION OF KENNETH FLOREY (Read)
 (9) BY MS STEWART
 (10) Q Mr Florey could you state your name and address for the
 (11) record please?
 (12) A Kenneth R Florey My home address is 19603 Belduque
 (13) Circle Chugiak Alaska 99567
 (14) Q Would you tell me what your educational background is?
 (15) A I have a bachelor of science degree in fisheries biology
 (16) from the University of Alaska Fairbanks 1974 graduate
 (17) Previous to that is high school and I was in the Navy for seven
 (18) and a half years in nuclear submarines Education there was
 (19) primarily in missile electronics I've had training post
 (20) college days primarily in program management negotiation
 (21) skills and that sort of thing
 (22) Q Could you tell me what full time employment you've had
 (23) since you left the University of Alaska Fairbanks?
 (24) A In June of 1974 I went to work for the Alaska department
 (25) of Fish & Game as a research biologist working on coho salmon

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1) in Southeast Alaska I was stationed in Juneau In October of
 (2) 1975 I was transferred to Soldotna as the area biologist for
 (3) the FRED division which is fisheries enhancement
 development
 (4) In December of 1977 I was transferred to Anchorage as the
 (5) regional project manager for FRED division I was responsible
 (6) for all the program management of the FRED programs in most
 all
 (7) of western Alaska excluding Prince William Sound and Cook
 (8) Inlet And in December of - well actually January 1st 1980
 (9) I transferred back to the commercial fisheries division as the
 (10) regional project or regional management biologist for Upper
 (11) Cook Inlet and Bristol Bay In December of 1983 I was made
 (12) regional supervisor for the central region which includes
 (13) Bristol Bay Cook Inlet and Prince William Sound and that is
 (14) the position I still hold
 (15) Q Turning to salmon first of all in Prince William Sound
 (16) what are the principal management challenges there from the
 (17) standpoint of ADF&G?
 (18) A The primary management challenge in Prince William Sound
 is
 (19) to try and harvest the nine to one or ten to one hatchery fish
 (20) to wild fish ratio without over harvesting stocks wild stocks
 (21) in the same fishery Also while prosecuting those fisheries
 (22) around those facilities trying not to over harvest sockeye
 (23) returns to Eshamy Lake and also to Coghill Lake Those are the
 (24) three major management concerns in western or Prince William
 (25) Sound along with the returns to Valdez Solomon Gulch
 hatchery

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(1) a similar thing trying to harvest returns to that facility
 (2) while not over harvesting wild stocks at Red River and in
 (3) Valdez on Port Hidalgo areas
 (4) Q Okay And am I right that the ten to one ratio you cited
 (5) has been a typical ratio of hatchery to wild pinks in Prince
 (6) William Sound since about 1988?
 (7) A While variable that is probably a reasonable percentage
 (8) 90 percent plus hatchery fish
 (9) Q And in those years since 88 or so has ADF&G been forced
 (10) to limit the harvesting largely to the terminal hatchery areas
 (11) themselves?
 (12) A Yes
 (13) Q And that is a change from the traditional fishery in which
 (14) the commercial fleet would spread over much of the Sound
 during
 (15) much of the summer is that correct?
 (16) A Yes
 (17) Q Moving over to Cook Inlet salmon management for a minute
 (18) I guess first of all on the Upper Cook what are the
 (19) significant management challenges there?
 (20) A The mixed stock fishery which has four major stocks -
 (21) five five major stocks the Susitna sockeye Cook Inlet or the
 (22) Fish Creek Big Lake sockeye Kenai sockeye Kaslof sockeye
 (23) Crescent River sockeye and trying to manage the fisheries to
 (24) obtain escapement goals in those systems while minimizing the
 (25) interception of coho salmon bound for the Susitna River and

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(1) chinook bound for the Kenai Those are the big ones as per the
 (2) Cook Inlet management plan
 (3) Q Going to a different topic for a moment you mentioned a
 (4) person by the name Al Menin as the inventor of the Bendix side
 (5) scan sonar Have you met with Mr Menin?
 (6) A Yes
 (7) Q Have you worked with him professionally?
 (8) A Yes
 (9) Q In what context?
 (10) A As a program manager we have hired Al Menin on an annual
 (11) basis to come to Alaska and work on our equipment to ensure
 (12) that it s working correctly
 (13) Q When Mr Menin visits or has visited since 1983 the sonar
 (14) sites in Upper Cook Inlet who does he work with from ADF&G?
 (15) A The various project leaders who are responsible for the
 (16) sonars in Cook Inlet That would be primarily Ken Tarbox and
 (17) Bruce King
 (18) Q Did Mr Tarbox and Mr King have experience in the
 (19) deployment and operation of the adult sockeye sonar counters
 in
 (20) Upper Cook Inlet?
 (21) A Yes
 (22) Q How far back does that experience go to your knowledge?
 (23) A Mr Tarbox since 1980 Mr King probably about the same
 (24) time
 (25) Q Does the Department of Fish and Game have any incentive to

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(1) make its adult sockeye salmon counts either high or low?
 (2) A No
 (3) Q Have you visited the sonar sites in Upper Cook Inlet?
 (4) A Yes
 (5) Q Have you been to all of the ones that we talked about
 (6) Kenai the Kaslof the Crescent and the Yentna?
 (7) A Yes yes
 (8) Q Have you observed the operation of the sonar counter on the
 (9) Kenai River when it was - well when it was actually counting?
 (10) A Yes
 (11) Q Do you recall who you - what year or what years?
 (12) A Annually
 (13) Q Have you been out there every year since 1983?
 (14) A Yes
 (15) Q Do you go out there sometimes unannounced?
 (16) A Always unannounced
 (17) Q Well is it your belief that ADF&G personnel do monitor the
 (18) counter during the course of a day when the run is going up the
 (19) river?
 (20) A Yes
 (21) Q Do they do that on an hourly basis?
 (22) A Yes
 (23) Q Have you observed calibration of the counter occurring?
 (24) A Yes
 (25) Q Have you yourself calibrated the counter?

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- (1) A Not in an official capacity
 (2) Q Well have you had calibration explained to you by Mr
 (3) Menin or Mr Tarbox and Mr King?
 (4) A Yes
 (5) Q All three of them?
 (6) A Yes
 (7) Q Have you looked through the oscilloscope that s part of the
 (8) counter deployment?
 (9) A Yes
 (10) Q And have you observed spikes in the oscilloscope as
 sockeye
 (11) pass?
 (12) A Yes
 (13) Q From your observations and explanation do you believe that
 (14) the adult sockeye side scan sonars are useful - are a useful
 (15) management tool?
 (16) A Yes
 (17) Q Why is that?
 (18) A Primary management tool we use
 (19) Q And is that true specifically with respect to the Kenai
 (20) River sockeye and adult sockeye counter?
 (21) A Yes
 (22) Q With respect to escapement counts generally does the
 ADF&G
 (23) commercial fisheries division endeavor in good faith to come up
 (24) with the best escapement numbers that it can?
 (25) A Yes

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- (1) Q Do you know of any way in which the department would gain
 (2) anything by making those numbers artificially high or low?
 (3) A No
 (4) Q Would you personally gain anything as regional supervisor?
 (5) A No
 (6) Q Okay well let me ask you this is collecting data on the
 (7) catch and the escapement the single most important piece or
 (8) status particular that is gathered by ADF&G?
 (9) A Yes
 (10) Q In the years that you ve been the regional supervisor for
 (11) the central region has collecting that information been a
 (12) significant part of your job?
 (13) A Yes
 (14) Q Is that something you took seriously?
 (15) A Yes
 (16) Q And did the managers that worked under you also view that
 (17) as a significant part of their job?
 (18) A Yes
 (19) Q In terms of inseason management what techniques does
 ADF&G
 (20) use in the central region to assess the escapement of the
 (21) various species in the streams you look at?
 (22) A In the central region we use sonar counting tower weirs
 (23) and aerial surveys
 (24) Q And do you view - do you view coming up with an accurate
 (25) escapement number as an important part of your job?

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- (1) A Yes
 (2) Q Why is that?
 (3) A It s the basis for our management decisions It s the
 (4) basis by which we build our entire data base to hopefully in
 (5) the future become even more accurate with our management
 and
 (6) maximize the yield of the resource back to the various users
 (7) Q Do you believe that the escapement counts that ADF&G
 comes
 (8) up with in the various management areas that you oversee are
 (9) generally accurate?
 (10) A As I stated before with the sonar there s certainly a
 (11) range around those estimates but yes for the purposes of
 (12) management yes they are accurate in my estimation
 (13) Q Do you believe that they are sufficiently accurate to permit
 (14) you to manage those fisheries effectively?
 (15) A Yes
 (16) Q And to build on the resource?
 (17) A Yes
 (18) Q What is the current status of the fishery stocks in the
 (19) central region the principal fishery stocks in the central
 (20) region and I m focusing on those that are targeted by the
 (21) commercial fisheries compared with what is in I guess it was
 (22) in 1972 you indicated when you first came to Alaska?
 (23) A As a general statement they are healthier
 (24) Q Do you believe that the strength of those resources as of
 (25) today compared to 20 years ago is related at all to the quality

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- (1) of the management that ADF&G has applied to them?
 (2) A That is one important factor
 (3) Q What other factors could have been involved in that?
 (4) A Favorable weather conditions and the Magnuson Act
 (5) Q How has favorable weather helped?
 (6) A Cold winters in the early 70s were very detrimental to all
 (7) the salmon stocks We haven t had those same similar severe
 (8) weather conditions We ve had milder weather than we had to
 (9) years ago
 (10) Q And how has the Magnuson Act helped?
 (11) A Decreased the high seas interception
 (12) Q So you would say good management good weather and the
 (13) Magnuson Act for the improvement in Alaska fish stocks in the
 (14) last 20 years?
 (15) A Yes
 (16) Q Any other factors you cite?
 (17) A Those are the primary ones
 (18) Q So then what is the State of herring abundance now
 (19) compared to 20 years ago?
 (20) A It s good
 (21) Q Is it stronger than it was?
 (22) A Yes
 (23) Q Is the biomass larger?
 (24) A Yes
 (25) Q And to what do you attribute that?

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- 1 A Primarily good weather and decreased interception in the
 2 high seas
 3 Q Now I m going to talk regarding a memo from you to ADF&G
 4 headquarters the commercial fisheries division and I m going
 5 to show you Mr Florey what has been marked as Exhibit DX48
- 6 excuse me 5843 I m going to show you the first couple
 7 pages At this time appears to be a memorandum from you and
 8 Charles P Meacham to Ken Parker and Doug Eggers dated
 June
 9 19th 1989 Do you recall authoring this memorandum?
 10 A Yes
 11 Q And is that your signature on the front page there where
 12 it says Ken?
 13 A Yes
 14 Q Do you recall what circumstance - what the circumstances
 15 of your preparing this were?
 16 A We previous to this memo had discussed the PPC meeting
 17 which is the policy planning committee which is the regional
 18 supervisors the director and the chief fisheries scientists
 19 the needs for an escapement goal policy so we could on a
 20 statewide basis implement an escapement goal policy that was
 21 consistent About that time the oil spill happened then Out
 22 of that this draft document was produced by Mr Eggers and
 23 sent out to the other members of the PPC for review That is
 24 why we drafted the response back to Mr Park - Mr Ken Parker
 25 and Doug Eggers that we did It was in response to this draft

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- 1 Q This draft that is attached to your memo in the second
 2 paragraph talks about the impact of the presence of oil in the
 3 normal prosecution of fisheries Was this draft the result at
 4 least in part of the fact of the Exxon Valdez oil spill?
 5 A Yes
 6 Q And was it at least in part addressed to trying to deal
 7 with the management difficulties that arose from that?
 8 A That was my understanding
 9 Q Now you list some of your specific concerns and the first
 10 one which is in the third paragraph of your memo which says
 11 would the biological justification within the policy apply to
 12 overescapement situations caused by fishermen price industry
 13 disputes Were you concerned about that at the time?
 14 A We have a history of problems in the state where fishermen
 15 go on strike if they re not happy with the price Because of
 16 that more fish go up the river in excess of escapement
 17 goals It s happened on a number of occasions
 18 Q In other words the escapement goal has been exceeded
 19 because there wasn t sufficient effort to catch the fish?
 20 A Correct
 21 Q Do you recall any specific years or fisheries where that
 22 occurred?
 23 A 1980 in Bristol Bay was one example that jumps quickly to
 24 mind
 25 Q And I know there was a striking in 91 Did that cause

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- 1 overescapement?
 2 A In a couple of instances there were overescapements but
 3 there was a lot more fishing effort in 1991 than there was in
 4 1980 But yes in 1991 - again the one in 1980 was the
 5 really big one
 6 Q There was overescapement in 91 but it was smaller
 7 magnitude?
 8 A Compared to the 1980
 9 Q Because the strike was shorter?
 10 A Yes
 11 Q In DX5843 your memo addressing the potential ADF&G
 policy
 12 on overescapement in 1989 you also say how about
 escapement in
 13 excess of Emax associated with management imprecision
 what
 14 did you mean by that
 15 A He defines Emax in here as the level of escapement which
 16 produces the greatest expected return Escapements greater
 17 than Emax are greater than that which can be accommodated in
 18 either the rearing area or the spawning area of the system
 19 Using that as his definition of Emax through management
 20 imprecision that being where we make a management call and
 the
 21 result of that management call is more fish made it into the
 22 system than would be called for in Emax our question was
 what
 23 would we then be liable for fish in excess of that?
 24 Q What you were referring to is because you don t have total
 25 knowledge as to the size of the return the escapement goal is

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- 1 exceeded because of management decisions that are made is
 that
 2 right?
 3 A Because we were more conservative than we would have
 needed
 4 to have been
 5 Q Had you known -
 6 A Had we known more fish made it into whatever system
 7 Q Has that occurred in various years in some of the systems
 8 that you have overseen?
 9 A Yes
 10 Q Does it occur in part because of the need to be
 11 conservative in managing the fisheries?
 12 A Yes
 13 Q Is there some removal technique that would take the fish
 14 out as they entered or before they entered the river?
 15 A Well to do it in a manner to have any chance of success
 16 you would have to do it somewhere below where you counted
 them
 17 but above the commercial fishery Then - so then -
 18 Q So somewhere low in the river then?
 19 A Low in the river using lead weirs The fish are closely
 20 oriented to the bank and it would be a very easy thing to do to
 21 remove some of them from the river some from the river at that
 22 point because they would be easy to catch
 23 Q What do you mean by a lead weir? What is that?
 24 A If you look at a river and say the water is flowing from
 25 you to me and this is the river you go to each bank and you

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- (1) put out a picket fence at an angle into the stream which say
- (2) goes out say one hundred feet on either side and the fish are
- (3) very closely bank oriented They come up and they would lead
- (4) right along that picket fence in tight to the bank and you
- (5) could somehow have some capture structure at the top where
- you
- (6) could remove them
- (7) Q Well focusing on the Kenai because the sockeye are bank
- (8) oriented it would be easy to get them into those weirs?
- (9) A Very easy
- (10) Q Referring again to that memo DX5843 which is your memo in
- (11) response to the ADF&G s circulated draft policy regarding
- (12) potential overescapement on Page 2 in the first paragraph you
- (13) say there appear to be very few citations regarding the
- (14) mechanisms associated with reduced production We think this
- (15) is a largely theoretical discussion For example what studies
- (16) show the relationship between egg density and egg survival
- (17) Are there data outlining the relationship between fry
- (18) emergence - fry and emergence and marine survival close
- (19) quote What are you referring to in that paragraph?
- (20) A The fact that is there or is there not data studies that
- (21) have been done that shows the effect of overescapement based
- (22) upon the relationships of egg density and egg survival In
- (23) other words instead of in the wild versus inside to
- (24) demonstrations There wasn t a lot of information This is a
- (25) debate that rages within this profession on what
- overescapement

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- (1) means
- (2) Q At least in your view and Mr Meacham s view it would be
- (3) fair to say that you don t believe - or you - or would it be
- (4) fair to say that you don t believe or you believe there is a lot
- (5) that is not known about the relationship between for example
- (6) egg density and survival and fry emergence and marine
- survival
- (7) would that be fair?
- (8) A There is a lot that is not known
- (9) Q In this whole area of escapement what is - what is
- (10) optimal - oh in this whole area of escapement and what is
- (11) optimal?
- (12) A Yes
- (13) Q In the next paragraph you say I guess continuing on the
- (14) same theme do we really know the optimum or maximum
- escapement
- (15) for any system in Alaska Was it your view when you prepared
- (16) this memo that ADF&G did not really know what the optimum or
- (17) maximum escapement was for any system in Alaska?
- (18) A It s an ever changing situation of which as we get more
- (19) information our understanding becomes better We know
- more
- (20) now than we did in 1989 We knew more in 89 than we did in
- (21) 85 et cetera It s a very plastic totally and ever changing
- (22) dynamic situation of which we re just now starting to
- (23) understand
- (24) Q Then you go on to talk about not having sufficient
- (25) confidence in spawner recruit smolt euphotic volume and
- other

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- (1) theoretical means of describing salmon production In the next
- (2) sentence Does that accurately state your belief that at the
- (3) time with respect to at least Cook Inlet Prince William Sound
- (4) and Prince William Bay (sic)?
- (5) A Yes
- (6) Q Still referring to DX5843 your memo responds to the
- (7) ADF&G s draft policy on overescapement, down in the third
- (8) paragraph from the bottom about the middle of the page you
- say
- (9) quote we are concerned that we may be over reacting There is
- (10) no precedent for the department to respond to
- overescapement
- (11) We have had overescapement in many instances in the past
- and
- (12) not responded in this manner close quote Is that an accurate
- (13) statement?
- (14) A Yes
- (15) Q What instances did you have in mind when you made that
- (16) statement?
- (17) A If you have a stated escapement goal and more fish go into
- (18) that system than your stated goal you by definition have an
- (19) overescapement That does not necessarily mean you won t
- get
- (20) good production off of that but with the information you have
- (21) at that point in time that is your best guess of what the
- (22) system can produce so until you have a lot more information
- (23) and we normally change the escapement goals usually on like a
- (24) four or five year rotation depending upon information we have
- (25) we just at that point had never reacted in that fashion when we

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- (1) had large escapements in excess of our stated goals I felt
- (2) that - and felt that would not would be a poor precedent to
- (3) start reacting in that fashion now very inconsistent with the
- (4) way we operated in the past
- (5) Q Were there many years in each of the systems that you
- (6) managed where there was overescapement?
- (7) A No not many But certainly some and again to varying
- (8) degrees
- (9) Q Do you recall any particular ones where there was
- (10) overescapement?
- (11) A 87 and 88 in Kenai River obviously There s been a
- (12) number of instances in Bristol Bay be it Egegik Ugashik
- (13) Igushik Nushagak and Naknek where we ve had escapements
- in
- (14) excess and sometimes way in excess of stated goals
- depending
- (15) upon the circumstances most of the time beyond our control
- (16) Q Has the department in fact raised the escapement goals
- (17) during the 1980s on rivers in the Bristol Bay system sockeye
- (18) producing rivers?
- (19) A Yes
- (20) Q What reasons have gone into those increases?
- (21) A The factors I just mentioned
- (22) Q Is it fair to say that in general the conclusion of the
- (23) department was that those river systems could sustain a larger
- (24) spawning population than historically had been in those rivers?
- (25) A Yes

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- (1) Q On the Kenai River in Upper Cook Inlet have you ever seen
 (2) a return - or excuse me have you ever seen an escapement
 (3) that
 (4) you included was above the optimum in terms of a maximum
 (5) sustained yield?
 (6) A Based on current information I could not answer that The
 (7) best information we have to date would be escapements to 87
 (8) and it would be difficult to characterize that we ve had a
 (9) problem so far based on those escapements
 (10) Q So in your view it s too early to tell what the impact of
 (11) the record escapement in 1987 is?
 (12) A That s correct
 (13) Q Referring to 1989 in the possibility of overescapement in
 (14) Upper Cook Inlet did you see a risk that if you let the
 (15) escapement rise beyond the levels you had traditionally set in
 (16) some of the systems you were responsible for because of the
 (17) spill and because there would be no harvest that year did you
 (18) see a substantial risk that you might get a poor return because
 (19) of that result?
 (20) A There was that possibility
 (21) Q Mr Florey I m showing you a July 5th 1989 memorandum
 (22) from Mr Hilsinger to you which has been marked as Exhibit
 (23) DX5842 Do you recall receiving this memorandum?
 (24) A Yes I do
 (25) Q Paragraph four Mr Hilsinger in the second sentence says
 (26) having escapements of 1 6 million 1 1 million excess and 1 0

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- (1) million 300 000 excess in the Kenai River is providing us with
 (2) valuable information regarding the productive capability of
 (3) that system quote unquote Do you agree with that statement?
 (4) A It s certainly providing more data points which we
 (5) previously did not have
 (6) Q And in paragraph five Mr Hilsinger says in a large number
 (7) of river systems we simply do not know when it is E -
 (8) A Emax
 (9) Q Emax or Eopt probably and then it says the existing
 (10) escapement goals may not represent these values very well and
 (11) then he says additionally the Emax will change every year
 (12) depending on fresh water and marine survival Do you know
 (13) what
 (14) he meant by that
 (15) A Every system is dynamic every minute of every day of every
 (16) year the system you cannot put a specific number of terms
 (17) because conditions change so in a general sense you could
 (18) have
 (19) a set of parameters but specifically depending upon
 (20) environmental conditions Those carrying capacities change
 (21) they re dynamic
 (22) Q Okay So the number of spawners that will produce the
 (23) maximum return in one year is probably different than the
 (24) number that will produce the maximum return in another year?
 (25) A Yes
 (26) Q And then in the last sentence of this paragraph Mr
 (27) Hilsinger says no systems in Cook Inlet have a long enough

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- (1) history of good data to accurately determine Emax Do you
 (2) agree with that statement as of July 19th 1989?
 (3) A Yes
 (4) Q I m going to show you now a document that has been
 (5) marked
 (6) as Exhibit DX4030 and this is a letter from Theo Matthews the
 (7) president of UCIDA to Don - well he spells it Collingworth
 (8) but it s Don Collingsworth dated July 27th 1989 and it copies
 (9) you as the - he describes you as the area supervisor Do you
 (10) recall receiving a copy of this letter at or about this date?
 (11) A Yes
 (12) Q In DX4030 this memo Mr Matthews of the Upper Cook Inlet
 (13) drift association says although conditions obviously were good
 (14) pour the 1987 offspring this may not be the case for the 1988
 (15) brood To expect conditions to be favorable three years in a
 (16) row may be unrealistic
 (17) Was that a concern that was raised by anyone within the
 (18) central region that is that it might be overly - excuse me
 (19) that it might be unrealistic to assume that there would be good
 (20) conditions for three years in a row for the volumes of
 (21) escapement that were occurring?
 (22) A Yes
 (23) Q Who did you talk to about that?
 (24) A All my Cook Inlet staff
 (25) Q And what was the consensus after this discussion? What did
 (26) you decide?

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- (1) A The consensus was there was concern but no concrete data
 (2) suggests anything at that point in time
 (3) Q You didn t have any data to indicate that that would
 (4) necessarily create a problem?
 (5) A At that point in time
 (6) Q And at that point in time did you - you did not have such
 (7) data?
 (8) A We did not have enough data point in time to determine
 (9) whether overescapement three years in a row was going to
 (10) negatively impact or not We certainly had concerns We
 (11) didn t have the hard data
 (12) Q Well now in 1987 you had an all time record escapement on
 (13) the Kenai River of 1 597 000 sockeyes is that right?
 (14) A In 1987 what was the number you said
 (15) Q 1 597 000?
 (16) A I believe 1989 was a little larger but yes
 (17) Q Bullet up to that time -
 (18) A Yes
 (19) Q That was the record How did that come about? Why was
 (20) the
 (21) escapement so high that year?
 (22) A We were limiting our ability to manage one very large
 (23) return two we had the Glacier Bay oil spill which impacted
 (24) our ability to aggressively harvest on the earlier part of the
 (25) run because of the oil spill
 (26) Q Any other factors?

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- (1) A Not that I can remember
 (2) Q Was that the largest sockeye return in the Kenai to that
 (3) date?
 (4) A Yes still is
 (5) Q Do you recall just roughly in rough terms what the total
 (6) return was that year?
 (7) A Total return 12 and a half 13 million something like
 (8) that
 (9) Q And it's still a record?
 (10) A Yes
 (11) Q Okay then 1988 the escapement was again over a million by
 (12) 20 000 plus fish Why was the escapement in excess of the goal
 (13) range that year do you recall?
 (14) A I don't remember specifically but I think the primary
 (15) concern was the fact that we had a little different run entry
 (16) pattern that we weren't able to maintain the harvest rate to
 (17) keep it under 700 000 But I don't remember specifically It
 (18) was - again it was the fact that it was a very large run and
 (19) early indications didn't quite support as aggressive a fishery
 (20) as we probably should have prosecuted therefore we went up
 (21) to
 (22) a million a million back in the river
 (23) Q Was run size a problem that year? Was it a big run?
 (24) A It was also a very good run yes It wasn't nearly as
 (25) large as 87 but it was a pretty good run
 (26) Q In either 1987 or 1988 do you recall there being any

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- (1) A Yes it was
 (2) Q Was there any impact from the Valdez oil spill on the
 (3) management of the fisheries in the central region this past
 (4) year in 1992?
 (5) A No not to my knowledge
 (6) Q What about 1991?
 (7) A Not to my knowledge
 (8) Q Do you recall that the 1990 salmon harvest in Prince
 (9) William Sound was an all time record 46 5 million fish?
 (10) A I believe that's correct
 (11) MS STEWART Thank you Concludes our direct
 (12) MS WAGNER Just to make the record clear the
 (13) deposition that the defendants have been reading from and
 (14) which
 (15) we will be reading from were taken on August 17 1982
 (16) September 24th and 25th 1992
 (17) We'll continue in the deposition of Ken Florey
 (18) CROSS EXAMINATION OF KENNETH FLOREY (Read)
 (19) BY MS WAGNER
 (20) Q Mr Florey with respect to your testimony about sonar
 (21) counters do you consider yourself to have any expertise
 (22) such - such that you can give a personal opinion on the
 (23) accuracy of sonar counters?
 (24) A No
 (25) Q Do you know who designs the sonics portions of the Bendix
 (26) sonar counters?

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- (1) discussion of trying to institute additional measures that
 (2) might have limited escapement towards the end of the season
 (3) when you realized that you were going to exceed the goal?
 (4) A I'd have to go back and look specifically But I think we
 (5) instituted - instituted the reduced closed mouth areas at the
 (6) mouth of the rivers that basically brought the drift in the
 (7) mouth of the river to mop up the surplus
 (8) Q Was that done in both years?
 (9) A I don't remember specifically I'd have to look We did
 (10) it a couple of those years I'd have to - have to go back and
 (11) look at the information
 (12) Q Do you recall any other measures that were considered to
 (13) try to limit the escapement?
 (14) A No
 (15) Q Okay in 1989 you had what was up to then - and maybe
 (16) still is - the all time record escapement on the Kenai River
 (17) almost 1 6 million What caused that?
 (18) A Large return and we did not have the drift fishery to help
 (19) us harvest so it was strictly a setnet fishery only and it was
 (20) just saturated We couldn't fish it any harder than we did
 (21) Q So the setnet fishery even though it was open most of the
 (22) season wasn't sufficient to mop up all the extra fish?
 (23) A That's correct
 (24) Q To your recollection was that a record year for the setnet
 (25) fishermen on the east side of the Upper Cook Inlet?

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- (1) A No I do not Are you talking about the hydrophones?
 (2) Q And the transducer
 (3) A No
 (4) Q Do you know a fellow named Don Rogers?
 (5) A Yes
 (6) Q Who is Don Rogers?
 (7) A He is a fisheries scientist that is employed by FRI
 (8) Fishery Research Institute
 (9) Q And are you aware of studies that Don Rogers did on the
 (10) Nushagak and Wood Rivers relating to the accuracy of sonar
 (11) counters?
 (12) A No
 (13) Q Have you ever heard that he's done it?
 (14) A No
 (15) Q Are you familiar with what was known as the zero tolerance
 (16) policy that was imposed in the wake of the Valdez oil spill?
 (17) A Yes
 (18) Q Did that in fact become part of the State's policy to
 (19) assure that no contaminated fish reached the marketplace?
 (20) A There was a memorandum of understanding that was drafted
 (21) between the Department of Fish and Game and DEC which
 (22) outlined
 (23) how we were going to manage the fisheries and which agency
 (24) and
 (25) what they would be responsible for
 (26) Q Was it your understanding that the goal of the memorandum
 (27) of understanding was to assure that no contaminated seafood

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reached the marketplace?

- (2) A Yes
- (3) Q Was that goal achieved?
- (4) A To my knowledge yes
- (5) Q Were you involved at all in the drafting of the memorandum of understanding?
- (6) A Yes I was
- (7) Q What was your role?
- (8) A As a contributor and editor
- (9) Q You actually wrote up portions of it?
- (10) A Yes
- (11) Q And what was your role in implementing it?
- (12) A Primarily on the management side to make sure - pardon me to make the determinations on the appreciable likelihood of getting gear fish and fowl and whether we would or would not open fisheries
- (13) Q Was it your belief that in implementing that memorandum it was important to err on the side of closure if there was any risk in oiling?
- (14) A Yes
- (15) Q Did you apply with that belief in your decisions as to whether or not to allow openers to occur?
- (16) A If there was in our estimation appreciable likelihood that they fouled gear or product we would not open the fishery
- (17) Q Okay So to the best of your knowledge no commercial

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- (1) fishermen ever brought in an oiled fish in the 1989 season?
- (2) A To the best of my knowledge there were no oiled fish
- (3) Q And do you attribute that result in whole or in part to the application of the memorandum of understanding?
- (4) A Yes I do
- (5) Q What kinds of closures were there if you can describe them just generally in Prince William Sound as a result of the oil spill?
- (6) A Large area closures in areas of western and southwestern Prince William Sound where there was contamination of the beach Areas that were outside of the oiled area were open but were analyzed on a daily basis to ensure that there was not appreciable likelihood The entire drift fishery Upper Cook Inlet was closed for the season Setnet fishery was left open with the exception of closure on one day There were large areas closed in the Lower Cook Inlet where the beaches were oiled Some of the more inside areas or areas were free of oil contamination or there was no appreciable likelihood were opened in 1989
- (7) Q Were there any other gear types that were totally shut down other than the Upper Cook Inlet drift fleet?
- (8) A Herring fishery in Prince William Sound was not opened in 1989 Also there were - there was closures in the ground fishery and also the shrimp shell fisheries in Prince William Sound and Lower Cook Inlet after a portion of time Halibut

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- (1) fishery went on schedule
- (2) Q Okay Following up on zero tolerance zero tolerance was not in any way kept a secret was it?
- (3) A No
- (4) Q It was widely publicized and known by fishermen and everybody else involved?
- (5) A To my knowledge yes
- (6) Q It was promulgated was it not well in advance of most of the major fisheries?
- (7) A That s correct
- (8) Q Did you ever receive any objection from any representative of Exxon or Alyeska to the promulgation of the zero tolerance policy?
- (9) A Not that I recall
- (10) Q Are you aware of any other official of the State of Alaska that received objection by Exxon or Alyeska to the establishment of the zero tolerance policy?
- (11) A Not that I m aware of
- (12) Q Have you ever been told of any such thing?
- (13) A Not that I m remember
- (14) Q I m going to ask you a very similar question What I just asked you about is whether or not you had any objections to the establishment of the policy Do you recall ever receiving any objections from Exxon or Alyeska to any specific fisheries closure that resulting from the existence of the zero tolerance

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- (1) policy?
- (2) A Not that I can specifically recall
- (3) Q Showing you Mr Florey what s been marked as Exhibit 3707 do you recognize this as the 1989 annual management report for Upper Cook Inlet prepared by Paul Ruesch?
- (4) A Yes
- (5) Q If you would turn to page 3 Arabic three it is actually about ten or 12 pages into the document there is a heading there Exxon Valdez oil spill and then a discussion of the impact of the spill on the 1989 Upper Cook Inlet fishery and in the second paragraph Mr Ruesch talks about test fishing that was done and in the second sentence he says quote crude oil is generally in the form of mousse patties - excuse me crude oil is generally found in the form of mousse patties was readily found throughout much of the central district being most concentrated near the tidal rips the most important area of the park for the gillnet fishery
- (6) Were you involved in the decision under the memorandum of understanding to essentially close down the drift gillnet fleet in Upper Cook Inlet in 1989?
- (7) A Yes
- (8) Q Did you discuss that issue with Mr Ruesch?
- (9) A Yes
- (10) Q And did you agree with the decision to essentially close that fishery for the summer?

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- (1) A Under the guidelines of the memorandum of understanding
 (2) that was our decision
 (3) Q Focusing specifically on the order of July 19th that closed
 (4) the Upper Cook Inlet drift fishery until August 5th I have the
 (5) following question and it is more – a more specific iteration
 (6) of a question I asked you earlier Did you receive or to your
 (7) knowledge did the department receive any objection
 whatsoever
 (8) from Exxon or Alyeska with respect to that order?
 (9) A Not that was given to me or that I recall was given to
 (10) anyone else
 (11) Q Have you ever even heard of such a thing?
 (12) A Not that I remember
 (13) Q Now Mr Clafin asked some questions about whether you
 (14) considered other methods of in essence harvesting Kenai fish
 (15) Are you aware of any reasonable or prudent methods that the
 (16) state might have adopted that could have appreciably affected
 (17) the amount of escapement in the Kenai River in 1989?
 (18) A Not that could have been implemented in the time frame we
 (19) were dealing with
 (20) Q Is it fair to state that Alaska Fish & Game did everything
 (21) it could to control escapement into the Kenai in 1989?
 (22) A Within our ability I believe so yes
 (23) Q And to the extent that you lacked the ability one of the
 (24) reasons you lacked the ability to do more is because you didn't
 (25) have all of the management information you would have had
 had

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- (1) the drift fleet been fishing correct?
 (2) A In a general sense More correct would be that we did not
 (3) have the fishing power of the drift fleet to help us curb
 (4) sockeye and I said – as I said there was no more management
 (5) decisions to be made It was very clear that we could or
 (6) couldn't – what we could or couldn't do We fished as hard as
 (7) we could with what we had available
 (8) Q So basically would it be your opinion that the Upper Cook
 (9) Inlet setnet fleet harvested as many fish as it could
 (10) possibly – as it possibly could have harvested in 1989?
 (11) A Based on the way we ended up managing the season I don't
 (12) know how they could have caught anymore
 (13) Q Would it be feasible to do anything with respect to the
 (14) inriver users that is increase the bag limit for sport
 (15) fishermen or subsistence users to try to limit escapement in
 (16) years of large runs?
 (17) A I don't believe that it would effectively harvest the
 (18) numbers that were there in 87 or 89 that being over double
 (19) the escapement goal
 (20) Q It is correct is it not that the catch from the
 (21) commercial drift fleet in Upper Cook Inlet is perhaps the most
 (22) important piece of management information you use in gauging
 (23) potential run size mid season?
 (24) A Prior to the salmon hitting the beach and therefore
 (25) becoming exposed to the setnet fishery the drift fishery has

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- (1) the really only option to sample the run size and so
 (2) characterizing in that fashion I would say yes it is very
 (3) important
 (4) Q And you didn't have that management tool available in 1989?
 (5) A That's correct
 (6) Q And that was because of the Exxon Valdez oil spill wasn't
 (7) it?
 (8) A It was due to the fact that there was oil in the central
 (9) district that's correct
 (10) MS WAGNER Thank you
 (11) MR COOPER Your Honor Defendants would call as the
 (12) next witness Tom Carlson
 (13) THE CLERK Would you raise your right hand?
 (14) (The Witness Is Sworn)
 (15) THE CLERK Please be seated For the record, sir
 (16) state your full name your address and spell your last name
 (17) please
 (18) THE WITNESS My name is Thomas James Carlson I live
 (19) at 323 Skagit Street in Richland Washington 99352 The last
 (20) name is spelled C A R L S O N
 (21) DIRECT EXAMINATION OF THOMAS CARLSON
 (22) BY MR COOPER
 (23) Q Good afternoon Dr Carlson How are you?
 (24) A Doing fine
 (25) Q You have the privilege and honor of being the last witness

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- (1) on the afternoon before a four day holiday Everybody of
 (2) course is thinking of nothing except what's going on in this
 (3) courtroom
 (4) THE COURT At least up until now
 (5) BY MR COOPER
 (6) Q Dr Carlson can you tell us what your current employment
 (7) is?
 (8) A I'm currently working as a staff research scientist at
 (9) Battelle Labs in Richland Washington
 (10) Q And what kind of an organization is Battelle Labs?
 (11) A Battelle is a not for profit research company
 (12) Q And we've already heard some testimony from some other
 (13) witnesses about Battelle but generally what kind of work
 (14) does it do?
 (15) A It does a broad range of research and development
 (16) activities including running the DEO's Pacific northwest
 (17) laboratory
 (18) Q DEO is?
 (19) A Department of energy I'm employed in a group that does
 (20) aquatic ecology types of research
 (21) Q Can you tell us about your educational background degree
 (22) in –
 (23) A I have bachelor's and a master's and a Ph.D. all in
 (24) fisheries science
 (25) Q And when did you get your bachelor's degree?

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- 1 A That was 1971
 2 Q And your master s degree?
 3 A 1974
 4 Q And your Ph D ?
 5 A 1979
 6 Q And those were all from the University of Washington?
 7 A All from the University of Washington
 8 Q Seems like we ve seen a number of people here who have
 9 received an education or part of it at the University of
 10 Washington Is that a particularly prominent place for people
 11 who are interested in fish?
 12 A Particularly salmon
 13 Q Now I want to get a little bit of information about
 14 your - about your employment history and kind of work that
 15 you ve done Can you tell us just give us very briefly what
 16 you have done and the nature of the work that you ve done in
 17 fisheries or fish biology?
 18 A Okay I need to start with my master s work where I was
 19 working as a research assistant in the Kvichak system
 20 Q You might want to spell that
 21 A Kvichak?
 22 Q Yes
 23 A It s K V I C H A K
 24 Q That s an Alaskan system?
 25 A That s an Alaskan system Lake Iliamna is the major lake

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- 1 A Well in this particular case we re interested in what
 2 portion of the zooplankton community that the juvenile sockeye
 3 preferred and in particular I was interested in a specific
 4 zooplankton name of the zooplankton is bosmina and I was
 5 particularly interested in how portions of that population were
 6 being consumed
 7 Q Did you do any work on the Kvichak in connection with
 8 spawning ground surveys?
 9 A Yes I did We went to the spawning grounds of course
 10 after the fish were spawned out We measured the fish
 11 obtained sex information and also collected otolith
 12 Q Otolith may be a term that people are going to hear about
 13 more What s an otolith?
 14 A Otolith is a bone in the inner ear of fish and it has a
 15 unique property It s like a scale You can deduce some of
 16 the life history from looking at its otolith
 17 Q Kinds of like the rings of a tree?
 18 A Kind of like the rings on a tree
 19 Q You can tell how old the fish are by looking at this little
 20 otolith?
 21 A That s correct
 22 Q Let s see Now we were kind of getting your background
 23 here and we talked about the Kvichak What else have you
 24 done?
 25 A You mean besides Kvichak?

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- 1 there and the Kvichak system is the largest producer of
 2 sockeye salmon in the world I believe
 3 Q What kind of work were you doing there on the Kvichak?
 4 A A variety of things but my responsibility was primarily
 5 the secondary production and that was looking at the
 6 zooplankton that were in the lake
 7 Q The zooplankton - and that s what the salmon feed on?
 8 A That s right that s the primary food for juvenile sockeye
 9 Q You were looking at the food production of the lake?
 10 A That s correct
 11 Q What else were you doing on that Kvichak project?
 12 A We did a variety of things When we weren t involved in
 13 the primary activity why then you usually did a number of
 14 other things We did -
 15 Q Did you look at -
 16 A Pardon?
 17 Q Did you look at fry behavior for instance?
 18 A I looked at fry behavior and that included helping out
 19 with the work to do the abundance estimates distribution of
 20 fry within the lake
 21 Q Did you look at matters concerning selective predation by
 22 fry?
 23 A Sure did
 24 Q Can you - now having said that can you explain what that
 25 means for us?

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- 1 Q Yes
 2 A Okay Following that I went to work for an engineering
 3 company in the midwest and there I did what s more
 4 characterized as physical limnology
 5 Q Physical limnology is going to be a term that some of us
 6 probably won t be too familiar with at least What does that
 7 mean?
 8 A Physical limnology has to do with the behavior mainly of
 9 the water mass that constitutes lakes or reservoir
 10 Q And does that - what kind of things do you look at if
 11 you re a limnologist?
 12 A Well there are two primary things you look at in that
 13 area is you look at the temperature how heat is actually
 14 stored and distributed in the water body and you also look at
 15 what s called a mass budget You look how the water actually
 16 moves within the water body how quickly it moves in how
 17 quickly it moves out Evaporation
 18 Q Then do you try to relate that to the biota in the lake?
 19 A You absolutely do The temperature regime of the lake
 20 aspects of the mass budget determine the suitability of the
 21 lake or the reservoir for certain species of fish
 22 Q Now was that with Harza Engineering that work you were
 23 describing?
 24 A Yes that was Harza
 25 Q How about in connection with your Ph D what kind of work

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- (1) did you do there that involves some of the things we re going
 (2) to be talking about today?
 (3) A Okay My Ph D work the dissertation itself was involved
 (4) with the sound scattering properties of salmonids What s
 (5) meant by that is it had to do with sonar and there s a branch
 (6) of sonar that s involved with assessing fish populations It s
 (7) a very well developed science and many of the major fisheries
 (8) in the world are managed using sonar information And the
 work
 (9) that I did I looked at how fish of various sizes scattered
 (10) sound at two different frequencies depending upon their
 (11) activity level
 (12) Q Now have you continued to have an interest in
 (13) hydroacoustics as well as these other areas you ve talked
 (14) about?
 (15) A Oh yes it s continued
 (16) Q Can you tell us just describe for us briefly what your
 (17) background is in terms of your work experience involving
 (18) hydroacoustics?
 (19) A As I - starting with my Ph D the time I was working on
 (20) that I participated in a rather large number of studies in
 (21) areas such as the offshore marine environment off Sana Onofre
 (22) in California through the lower Columbia River to several
 (23) lake systems in Washington state and in Canada In almost all
 (24) of these cases what we were interested in were three things
 (25) We were interested in the behavior of fish We were also

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- (1) interested in the distribution at a particular point in time
 (2) We were also interested in estimating their abundance
 (3) Q Now have you in fact performed hydroacoustic surveys of
 (4) fish?
 (5) A Yes a great many of them
 (6) Q Including salmon?
 (7) A Including salmon uh huh
 (8) Q Let me just list a few here and see if I could cover part
 (9) of it at least Banks Lake?
 (10) A Banks Lake that s a reservoir in Washington state and has
 (11) a population of kokanee
 (12) Q Population of?
 (13) A Kokanee land locked form of sockeye
 (14) Q If you got a sockeye that never gets out to the ocean
 (15) you ve got something that s called a kokanee?
 (16) A That s a sport fish Americans really love
 (17) Q How about Lake Roosevelt?
 (18) A Lake Roosevelt is one of the storage reservoir on the
 (19) Columbia River and it s in back of Grand Coulee Dam the dam
 (20) that maybe some of you have heard about
 (21) Q You ve done work in Alaska on the Egegik?
 (22) A I ve done work in Alaska on the Egegik In that particular
 (23) case it was a special project to try to look inseason and
 (24) determine the number of adult sockeye that had made it inside
 (25) the fishing boundary and were escaping into the river system

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- (1) Q This is all utilizing sonar units?
 (2) A This is all sonar
 (3) Q You also worked - I don t think we need to spend time on
 (4) it Wenatchee?
 (5) A Like in Washington state?
 (6) Q Lower Columbia River
 (7) A Right
 (8) Q You ve referred already to the offshore manne work I
 (9) think at Sana Onofre and one called - look I m not going to
 (10) be able to pronounce it
 (11) A Ozoyouss It s another lake system in the northern part of
 (12) the state
 (13) Q These surveys have both adults and juvenile salmon?
 (14) A Usually not at the same time but been a mixture, adults
 (15) and juveniles depending upon the time of year you go there
 and
 (16) the life stage you re sampling for
 (17) Q Now have you instructed in short courses on some of these
 (18) subjects?
 (19) A Yes I have At the time I was getting my Ph D a program
 (20) was starting up or had been underway at the University of
 (21) Washington in marine acoustics and as part of that the
 (22) university offered short courses to train fisheries managers in
 (23) the use of acoustic instruments and I was a lecturer in those
 (24) short courses
 (25) Q Now you are also - you ve been involved with an

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- (1) organization called BioSonics?
 (2) A Yes I am
 (3) Q Could you explain what that organization is and what your
 (4) role is in it?
 (5) A It started out I was working at the applied physics lab
 (6) and two electrical engineers started a company called
 (7) BioSonics They were having trouble getting a technical
 (8) services activity going and I was able to earn part of the
 (9) company by actually doing that starting a consulting activity
 (10) and over the course of time I finally became the president of
 (11) that company
 (12) Q Are you still affiliated with BioSonics?
 (13) A No I m not
 (14) Q Now I think you told me that you also have an interest in
 (15) what I would call I guess or what you would call aquatic
 (16) ecology?
 (17) A Yes that s correct
 (18) Q Could you explain what you mean by that?
 (19) A Aquatic ecology is really trying to understand how aquatic
 (20) systems work how the various pieces fit together and what
 goes
 (21) right and what goes wrong That s it
 (22) Q Does your work that you ve described already when you ve
 (23) been to these various lakes doing survey work and limnology
 (24) work and so forth all involve aquatic ecology?
 (25) A It all meshes together When you go out there and make

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- (1) observations on a fish community or a zooplankton community
 (2) you observe fluctuations you observe trends and inevitably
 (3) what you re trying to understand you re trying to understand
 (4) the mechanisms that actually cause these sorts of events to
 (5) happen And that requires that you look at the - look at the
 (6) lake or whatever it is you re looking at as a system with parts
 (7) that sometimes work together sometimes don t
 (8) Q Let s see Are you a member of any professional
 (9) organizations?
 (10) A Yes I belong to the American Fishery Society
 (11) Q How about on any scientific review panels?
 (12) A I ve served on several I served on one international
 (13) review committee looking at - they were interested in
 (14) acoustic tomography which is part of our global warming
 (15) program trying to understand how the oceans are responding
 (16) to
 (17) increased CO2 in the atmosphere
 (18) Another part of that program was actually looking at krill
 (19) in the Antarctic I served as an advisor to that group I
 (20) also served as a member of a group intervening between
 (21) seismic
 (22) the seismic industry and fishermen in the Santa Barbara
 (23) Channel where the concern was the effects of high intensity
 (24) seismic survey activities on fish communities
 (25) Q Seismic survey being basically making a loud noise and -
 (1) A Putting a lot of sound in the water
 (2) MR COOPER Your Honor I would tender Dr Carlson as

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- (1) an expert in the areas of aquatic ecology salmon biology and
 (2) hydroacoustics
 (3) MR O NEILL Would repeat those one more time?
 (4) THE COURT Aquatic ecology salmon biology
 (5) hydroacoustics
 (6) MR COOPER Yes
 (7) MR O NEILL No objection
 (8) THE COURT Thank you Qualifications of Dr Carlson
 (9) are accepted
 (10) MR COOPER Thank you Your Honor
 (11) BY MR COOPER
 (12) Q Dr Carlson we ve talked about pink salmon and some other
 (13) species and we spent a lot of time the past couple days
 (14) dealing with the pink salmon life cycle What I d like to do
 (15) is to have a brief description of the life cycle of the sockeye
 (16) salmon since that s the species that you re going to be
 (17) dealing with here and it isn t really quite the same as the
 (18) pink salmon
 (19) A That s correct
 (20) Q We have I believe an exhibit that demonstrates the life
 (21) cycle Defendants DX7124 A which I ll put on the screen
 (22) Then again maybe I won t
 (23) That s an exhibit that indicates the life cycle of a
 (24) sockeye salmon?
 (25) A Yes that s correct

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- (1) Q I guess since we ve started at the beginning with the
 (2) others we ought to start at the beginning here We ve got the
 (3) eggs up there?
 (4) A Okay If you don t mind I have a hard time disconnecting
 (5) the eggs from the adults so if I could start there
 (6) Q Start on the other end Incidentally do you know how to
 (7) use the light pen?
 (8) A I think I do I ll give it a shot
 (9) Start with the adults and I think the Kenai system is a
 (10) good one to use as an example But the adults after spending
 (11) a period of time in the ocean a variable period of time
 (12) return in the - well they return this time of the year They
 (13) start coming in July and pretty much are finished by
 (14) mid August And the Kenai system there is actually an early
 (15) run that comes in earlier as well but regardless of what the
 (16) entry pattern might be fish are pretty much into the spawning
 (17) areas by late summer where they reside and complete
 (18) spawning
 (19) by late fall early winter at which time eggs are deposited in
 (20) the gravel of the spawning streams or beaches wherever the
 (21) sockeye have spawned
 (22) The next stage is the egg stage and the eggs are in the
 (23) gravel and they incubate for a period of time And towards the
 (24) latter part of the winter why then they start to develop and
 (25) start to become something that s beginning to look like a
 (1) fish And this particular stage is the alevin stage

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- (1) Q Is that when they have the yolk sac still?
 (2) A This is when they have the yolk sacs This is pretty much
 (3) standard and very similar to the pink salmon biology the story
 (4) that was heard earlier
 (5) They remain in this stage until they will go through the
 (6) button up process which you heard Erwin Brannon talk about
 (7) before And then let s go ahead and quit on that
 (8) And then beginning in April or May why then they emerge
 (9) from the gravel and these juvenile fish move out of the
 (10) spawning areas and sockeye salmon move towards lake
 (11) systems
 (12) that is the majority of them do
 (13) Q That s where I want to stop there for just a minute
 (14) because that s where they re a lot different from pink salmon
 (15) is that right?
 (16) A Yeah that s correct The pink salmon go directly out into
 (17) the marine environment but sockeye the majority of sockeye
 (18) require a lake that they can reside in for a period of one or
 (19) two or maybe even three years
 (20) Q So they re going into the lakes instead of into the ocean?
 (21) A That s correct they re going into the lakes instead of
 (22) into the ocean Go ahead and put a checkmark there
 (23) And their movement into the lake actually takes place in
 (24) two stages They initially move into the nearshore areas
 (25) which limnologists call the littoral areas then there they
 (1) grow a little bit and then over a period of time they go

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- (1) through a process that we call recruitment that is they move
 (2) towards the center of the areas towards the center of the
 (3) lake the more open areas of the lake
 (4) And that recruitment process is typically pretty complete
 (5) by July and that's where they reside They stay in that part
 (6) of the lake They feed on zooplankton and grow through the
 (7) summers and then stay over winter and then depending upon
 (8) their particular stage why then they may outmigrate as smolts
 (9) in the spring The outmigration that's a smolt right here
 (10) Q What is it that marks the difference between a juvenile
 (11) that's in the lake and something you now are calling a smolt?
 (12) A Well a smolt there are a bunch of physiological changes
 (13) and what have you but basically when the fish - when the
 (14) juvenile actually leaves the lake system and moves into the
 (15) river why then it's considered a smolt
 (16) Q And is the smolt stage the one now where it's preparing
 (17) itself for the saltwater?
 (18) A That's right It's - a lot of the preparation takes place
 (19) during the process of smoltification before they actually enter
 (20) the river system They typically aren't in the river systems
 (21) too long at least not in Alaska and not in the Kenai
 (22) Q You mean after they leave the lake as juveniles?
 (23) A After they leave the lake as juveniles they make their way
 (24) down to the ocean in a relatively short period of time No
 (25) more than a couple of days

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- (1) Q And how far down do they go - well I guess in the Kenai
 (2) system about how far are they going in the rearing place to
 (3) get to the ocean?
 (4) A Oh it's about - I think it's about 55 60 miles from the
 (5) Skilak to the outlet there and some of these fish come from
 (6) Kenai Lake so they have to come down through the river and
 (7) they have an appreciably greater distance to come some from
 (8) the Russian River some from Kenai Lake
 (9) Q So now they've smoltified and head down the river What
 (10) becomes of them?
 (11) A They move into the marine environment and they stay in that
 (12) environment for a variable period of time depending upon a lot
 (13) of factors In the Kenai system they typically spend one year
 (14) in the lake system and three years in the ocean environment
 (15) and
 (16) then -
 (17) Q Do you know where they go when they're in the ocean? We
 (18) heard about pink salmon going all around the north Pacific
 (19) A Well the sockeye pretty much should go around the north
 (20) Pacific too They cover a very broad range Their migratory
 (21) behavior covers a lot of geography so they go all the way out
 (22) go counterclockwise all the way out through the Aleutians and back
 (23) again into the spawning streams
 (24) Q How long are they out there?
 (25) A They're out there for a variable period of time Some of
 them come back after spending a year out there some come
 back

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- (1) after spending four years out there but the majority spend
 (2) three
 (3) Q I guess now in the case of the pink salmon we learned
 (4) because they're on a strict two year life cycle, you never have
 (5) the odd year group and the even year group mixing So it's
 (6) just one or the other That's not the situation here?
 (7) A No not at all You have age groups from more than one
 (8) brood year where the brood year means the year of spawning
 (9) You actually have a lot of genetic interchange between brood
 (10) years because of the multiple age groups because of this
 (11) complex life cycle So you actually have a lot of genetic
 (12) interchange in the population
 (13) Q So when the adults come in or when the adults will be
 (14) coming in later this year they will be comprised of fish that
 (15) were born over a few year period as opposed to all having been
 (16) born at the same time?
 (17) A Right They're actually - I think it's about six major
 (18) age classes that ADF&G uses in their forecasts
 (19) Q I've seen the professional way sockeye biologists refer to
 (20) age of these fish like a 1 3?
 (21) A Yeah That's -
 (22) Q That doesn't mean 1 3 years old does it?
 (23) A No it doesn't It's just - the convention is to have two
 (24) numbers like this and the - the 1 refers to the number of
 (25) winters that they spent in freshwater as they're in the

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- (1) freshwater lake system as juveniles The 3 refers to the
 (2) number of winters that they spent in the ocean
 (3) Q So a 1 3 age fish would have spent how many winters in the
 (4) lakes?
 (5) A It would have spent one winter in the lake and then three
 (6) winters in the ocean
 (7) Q But - because they come into the lake in the springtime?
 (8) A That's right
 (9) Q If you wanted to know - I mean if we asked you in human
 (10) terms how old would that fish be that 1 3 how many years old
 (11) would he be four?
 (12) A From the time of spawning it would actually be five
 (13) Q So if you want to know the total age you got to add one to
 (14) that?
 (15) A Got to add one to that
 (16) Q Okay Hopefully we won't have to get too hung up in that
 (17) And about how much do these fish weigh when they return?
 (18) A The Kenai River fish weigh in the vicinity of five six
 (19) pounds Nice fish
 (20) MR COOPER Your Honor I believe that this is
 (21) preadmitted
 (22) BY MR COOPER
 (23) Q All right Now we're going to - you're going to talk
 (24) here about two different issues is that right?
 (25) A Yes that's correct

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- (1) Q And let s take them one at a time and then when we get to
 (2) the second one we ll stop for a minute and talk about the
 (3) differences between the two But the first issue that I d like
 (4) to have you focus on is this issue about the sonar counting
 (5) unit in the Kenai River
 (6) A Okay
 (7) Q All right? And you understand that what we re talking
 (8) about here is the fundamental question of how many fish the
 (9) Upper Cook Inlet fishermen would have caught if there hadn t
 (10) been an oil spill in 1989?
 (11) A That s correct I understand that
 (12) Q So we re dealing here with the 89 harvest We re not
 (13) talking about what s going to happen in the years past 1989
 (14) and you also understand that Dr Rogers who was here to
 (15) testify earlier has testified to the effect that in fact there
 (16) were more fish that were in the Upper Cook Inlet available for
 (17) fishermen to catch in 1989 than the sonar unit in the Kenai
 (18) River was indicating?
 (19) A That s correct I understand that
 (20) Q Now you also understand that that claim turns on the issue
 (21) as to whether or not the sonar counter accurately counted fish
 (22) or whether it underestimated them?
 (23) A That s correct I understand that
 (24) Q So that s the first thing that we need to talk about is
 (25) the question of whether or not that sonar counter was working

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- (1) the way ADF&G thought it was or not Can you - well have you
 (2) been to that sonar counter?
 (3) A Yeah I sure have
 (4) Q Why don t we go back and pick up just a little bit just
 (5) explain a little bit about your background as to what you ve
 (6) done in connection with working - your work involving the
 (7) sonar counter on the Kenai River
 (8) A At the Kenai?
 (9) Q Yeah at the Kenai
 (10) A Okay I have to back up a little bit I ve had more than
 (11) a casual interest in the Kenai River or the Bendix side scan
 (12) sonar for quite a few years
 (13) Q That s the type of unit on the Kenai?
 (14) A Type of unit on the Kenai River It was a major competitor
 (15) with similar instruments that BioSonics was manufacturing and
 (16) so we were always concerned about how we might get an edge
 (17) and
 (18) get some of the - of that type of the state of Alaska s
 (19) business so it was a topic of study for many many years
 (20) As a consequence of that whenever I had an opportunity to
 (21) go to one of the sites and to see one of the systems operating
 (22) or talk to someone about it why then I took that opportunity
 (23) That changed of course in 1991 when I left BioSonics but
 (24) then through various circumstances I had the opportunity to go
 (25) and visit the sonar site as late as 1993 here again
 (26) Q About how many times - well since you - since Exxon

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- (1) asked you to look at this issue in this litigation you have
 (2) spent a fair amount of time up there at the site haven t you?
 (3) A I certainly have
 (4) Q Have you worked with the ADF&G people who have been -
 (5) who
 (6) are in charge of that sonar unit?
 (7) A Yeah I - both in 1992 and 1993 well throughout these two
 (8) years and even the latter part of 1991 and continued to the
 (9) present I ve spent a lot of time with Ken Tarbox box and Bruce
 (10) King In many respects I feel like I m part of the crew
 (11) there
 (12) Q And have you actually done work in conjunction with them
 (13) trying to look at some of these aspects of the Kenai counting
 (14) system?
 (15) A Yes I have both - well there are actually three kinds
 (16) of counting that are going on in the Kenai system One is the
 (17) counting of adults which uses the Bendix side scan sonar The
 (18) second is the counting of smolts juvenile fish that are
 (19) moving in the opposite direction of the adults going down the
 (20) river and then the fry that are in the lake They have
 (21) programs to do all three
 (22) Q And you ve basically worked on all three of those with the
 (23) people from ADF&G up there?
 (24) A I haven t worked on the adult counter project but the
 (25) other two I have
 (26) Q But you ve looked - you re familiar with the adult?

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- (1) A Oh yes very Yes absolutely
 (2) Q Now why do they use a sonar counter on the Kenai River?
 (3) Why can t they just count the fish by looking at them?
 (4) A Well the Kenai River maybe all of you here have seen it
 (5) but it s fed by water melted from a glacier so it has a lot of
 (6) very fine particles in it so that you can t see through the
 (7) water and observe the fish directly
 (8) Q You just can t see them?
 (9) A No you can t see them
 (10) Q There are other systems where - clear water systems where
 (11) you can see the fish?
 (12) A Oh yeah there are many of those
 (13) Q Now is sonar some kind of a brand new technology that s
 (14) just come out?
 (15) A No not at all It s - it s - it originally - or it
 (16) really got its boost during the second world war thanks to the
 (17) Japanese and their submarines and a way to detect them was
 (18) desperately needed and so there was a - there were major
 (19) advances at that point in time
 (20) Q Generally with a sonar unit what s - what s happened? I
 (21) think I ve heard you compare it to a light beam in the past
 (22) Can you explain how it works?
 (23) A That s correct It s very similar to that It consists of
 (24) a number of components one of which you ve already heard
 (25) about and that s the transducer itself or hydrophone both of

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- (1) those were terms that were used in depositions that you just
 (2) heard
 (3) And you can think of the transducer or the hydrophone as
 (4) the bulb in a flashlight There s a lot of other parts to a
 (5) flashlight other than just a bulb but that s an important part
 (6) of it What a bulb does in a flashlight is takes electrical
 (7) energy stored in a battery turns it into light energy and
 (8) what the transducer does is takes electrical energy from other
 (9) parts of the sonar and turns it into sound energy
 (10) And then the sound energy is sent out into the water in a
 (11) beam that in almost all respects is very much like a light
 (12) beam and that is that - the majority of the light is
 (13) concentrated in the center of the beam and then the beam gets
 (14) much less strong as you move towards the periphery and the
 (15) sonar beam looks exactly like that
 (16) Q Now you have an exhibit up there 5629 which I think may
 (17) help explain that
 (18) A Yeah This exhibit shows - everybody is familiar with -
 (19) well most people I talk to know what a fish finder is or a
 (20) fish locator and a fish locator is simply a sonar that s
 (21) looking vertically into the water column And they re used for
 (22) a number of purposes but most fishermen I know whether
 (23) commercial fishermen or sports fishermen consider them to be
 (24) an essential part of the tools that they use to find fish so
 (25) that they can become more effective in catching them

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- (1) What this exhibit shows is it shows how a fish locator
 (2) works These little funny marks here the ones I m going to
 (3) point to here what they actually - what they indicate is they
 (4) indicate the sound moving down through the water Sound
 (5) moves
 (6) through water very very rapidly and it goes a long distance
 (7) before it becomes weak and that s the reason that sound is
 (8) preferred over light in water for these kinds of jobs
 (9) But the sound goes down and when it encounters something
 (10) like a fish or the bottom in the water within a very small
 (11) amount of energy of that sound energy is reflected back
 (12) towards
 (13) the transducer
 (14) The transducer does two parts - does two things This is
 (15) how it s maybe unlike a flashlight bulb What it does is when
 (16) sound hits it it actually generates an electrical signal that
 (17) then can be used to show the location of what was hit in the
 (18) water column For instance those marks there are really
 (19) typical of the kind of marks you would see on the screen of a
 (20) fish finder or on the paper output chart of a fish finder
 (21) MR COOPER Your Honor I would ask to admit that
 (22) exhibit that we were just looking at 5629
 (23) (Exhibit 5629 offered)
 (24) MR O NEILL No objection
 (25) THE COURT Defendants Exhibit 5629 is admitted
 (26) (Exhibit 5629 received)
 (27) BY MR COOPER

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- (1) Q And I ll call up Dr Carlson Exhibit 8687 A Defendants
 (2) Exhibit 8687 A and this I think may help explain what the
 (3) transducer is and so forth how the sonar system works now
 (4) A Yeah this is a graphic almost - well it s
 (5) diagrammatically correct It shows what the components of the
 (6) Bendix side scan sonar are and it consists of a number of
 (7) pieces There are some pieces that are in the water and the
 (8) pieces that are in the water are what is called a - woops
 (9) what did I do now?
 (10) Q You ve done it now We ll all have to go home
 (11) A Oh there it is There s the substrate and really what
 (12) this is is it s a - essentially a piece of paper that s 60
 (13) feet long it lies in the water and it provides a smooth path
 (14) for the sound beam to follow
 (15) It also forces the fish to swim up and over and through the
 (16) beam With the side scanner fish can only be counted if they
 (17) go through the beam Not all of the units that ADF&G has
 (18) deployed have substrates but they were originally and
 (19) continue
 (20) to be an apparent part of some of their systems
 (21) The second part of the side scanner that s in the water is
 (22) the transducer and -
 (23) Q That s the one equivalent of a light bulb?
 (24) A That s correct that s the equivalent of a light bulb And
 (25) the transducer in the Bendix side scan sonars are about that
 (26) big around maybe three inches or so not very big The

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- (1) thing s not very thick either They re about like that so
 (2) they re actually very small and they re connected by a cable
 (3) to - just put a mark there so we keep track of things
 (4) connected by a cable to what on this diagram is called a
 (5) computer and what the ADF&G people refer to as a counter
 (6) This counter does a number of things One of the things it
 (7) does is it - it packages the electrical energy that goes to
 (8) the transducer and it also handles the electrical energy that
 (9) comes back from the transducer when sound comes back from
 (10) an
 (11) echo and it also has the circuitry that processes the echoes
 (12) and counts fish
 (13) Q The fish counting is actually done inside the - inside the
 (14) computer by counting the return echoes?
 (15) A Right And the computer is where the - the person who s
 (16) operating the sonar also makes the adjustments to assure its
 (17) correct operation
 (18) Check here The point I just put a check on is the
 (19) oscilloscope and the oscilloscope is really an electronic test
 (20) instrument And what I allowed the side scan operator to do is
 (21) to see the electrical signals the echo returns from fish and
 (22) these echo returns have the shape of - people here like to
 (23) call them spikes and they really are a very fast rising and
 (24) rather tall and narrow spike that appears on the screen and
 (25) very characteristic of fish echoes very characteristic
 (26) And then the last thing that is basically an integral part

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of the Bendix side scan sonar is the skilled operator Without
 2 a skilled operator the machine simply will not work properly
 3 and in many respects when I think about the Bendix side scan
 4 sonar I think of it as an extension of the operator itself
 5 it s a way to avoid the tedium the hours of observation that
 6 would otherwise have to go into enumerating escapement in
 these
 7 systems where the side scanner is used
 8 Q And you have worked with as you described these sonar
 9 technicians that are utilizing the Kenai equipment?
 10 A Have I worked with them?
 11 Q Yes
 12 A Do I know them? Yes I do
 13 Q And what s your opinion of their qualifications and
 14 capabilities?
 15 A Well on the Kenai system in particular they ve been
 16 rather fortunate in being able to return - or being able to
 17 retain their seasonal employees for long periods of time plus
 18 the people who have the primary supervisory responsibility
 have
 19 been involved in this project since 1980 so they have a group
 20 of very skilled operators
 21 Q All right Now you ve worked out a computer animation as
 22 it were In order to demonstrate how this sonar system works?
 23 A Yeah It s two or three clips showing how fish are
 24 actually counted and how they re not counted
 25 Q And this is DX8989?

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1 A Right
 2 Q Which with the Court s permission we ll go ahead and
 3 show
 4 THE COURT Is there objection to DX8989?
 5 MR O NEILL No objection
 6 THE COURT It is admitted
 7 (Exhibit 8989 received)
 8 THE WITNESS Could I explain what we re going to see
 9 before we go into it?
 10 BY MR COOPER
 11 Q Why don t you go ahead because it tends to go pretty
 12 quickly
 13 A Yeah it tends to go pretty quickly And there are a
 14 sequence - there are sequence of segments of this video and
 15 they help explain those things that sonar does and how fish are
 16 actually counted It turns out - as you ll see it turns out
 17 the velocity of sound in water is very fast It s almost 5 000
 18 feet per second if you can imagine that A bullet from a
 19 pistol for instance which is - the animation is much slower
 20 than that
 21 I ll do some of the explaining upfront That way I won t
 22 divert you from watching it
 23 What that allows you to do is it allows you to send out a
 24 number of pulses in a very short period of time six eight
 25 ten within a very short period of time This means that for

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(1) all practical purposes at least for fish the beam that you
 (2) are putting into the water is essentially there continuously
 (3) that is it s - a fish cannot swim in the region insonated by
 (4) the beam and get through without being detected That s
 (5) extremely important
 (6) Q In fact it usually detects it Usually get more than one
 (7) echo off the fish don t you?
 (8) A Right it s - the side scan sonar requires more than
 (9) one - they call it a hit more than one echo return from a
 (10) fish to consider that fish as counted
 (11) And then the fish themselves the primary scatterers those
 (12) things that cause echoes to form in a fish are the swim
 (13) bladder which is an air filled cavity in the body of the fish
 (14) and in salmon it s actually farther back in the body than you
 (15) might think
 (16) Q And you mean that the sound isn t echoing off the - off
 (17) the tissue and the muscle and so forth it s echoing off this
 (18) air bladder?
 (19) A Off the air bladder about 80 percent or more of the return
 (20) comes from the air bladder There s some reflection a small
 (21) amount off of other parts of the fish but most of it comes
 (22) from that air filled sac
 (23) Q Does the - when the sound hits the rest of the fish not
 (24) the sac does it just stop and is it absorbed or does it go on
 (25) through them or what?

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(1) A Goes on through - a fish s body like our own is mostly
 (2) water and since they re swimming in water there s nothing
 (3) really there to stop the sound And it s the same sort of
 (4) principle that is involved when you go in for diagnostic
 (5) ultrasound yourself pregnant women going in to look at their
 (6) fetuses what have you It s because your body has a very high
 (7) water content that sound is an effective diagnostic tool If
 (8) it weren t for that fact why then these wouldn t be used for
 (9) instruments
 (10) Q I kind of interrupted you in your explanation
 (11) A I was going to say the other part of the echo that comes
 (12) from the fish is formed mostly by the backbone but again
 (13) remember that about 85 percent of the echo comes from a very
 (14) very small part of the fish
 (15) I guess with that as a start we can go ahead and roll the
 (16) video
 (17) Q Incidentally on the video they re going to see some
 (18) animations of some fish swimming through the sonar beam?
 (19) A Yes
 (20) Q Is the - have you tried to make the speed at which they re
 (21) swimming through here relate more or less to the real world?
 (22) A We ve tried to make this simulation as accurate as
 (23) possible and we ve also tried to make it as comparable as
 (24) possible to the kinds of counting situations that are typical
 (25) on the Kenai River

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- (1) On the Kenai River what happens is the - the fish come
 (2) through at what's called a passage rate That's the number of
 (3) fish per hour and the passage rate is slow at the beginning of
 (4) the run builds to a peak and then it falls off in the latter
 (5) stages of the run as the adults move passed the counting
 (6) location
 (7) A characteristic of the Kenai is that there are some
 (8) important numbers Typical passage rates are about one
 (9) thousand fish per hour
 (10) Q We're going to be talking a lot more about this later
 (11) A A lot more about it and on this video you'll see two
 (12) passage rates one about a thousand fish per hour the other
 (13) about 5 000 fish per hour Sounds like a lot but when you
 (14) actually are breaking it down into the number of fish that move
 (15) through the acoustic beam at any point in time it's actually
 (16) kind of underwhelming I think and the video shows that
 (17) Q All right And feel free to narrate as we look at the
 (18) video here
 (19) (Videotape Played)
 (20) A Well the one block I forgot here on the Kenai the
 (21) current velocities are such - could that be stopped?
 (22) Q Yeah
 (23) A The current velocities are such that the fish are forced to
 (24) swim near the bottom of the river and nearshore and this is
 (25) important in terms of the accuracy of the side scan sonar

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- (1) since its range is limited And so they - there's - there
 (2) are three parts that have to be kept in mind regarding the side
 (3) scan sonar One is the environment the other is the behavior
 (4) of the fish and the other is the skillful operation of the
 (5) sonar itself
 (6) If there is something in the environment that permits the
 (7) fish to behave in other than an optimum way why then the
 sonar
 (8) itself will not produce accurate estimates
 (9) Q You made the statement a moment ago that the fish swim
 (10) towards the bottom And why is that?
 (11) A The reason for that is that in channels like rivers
 (12) they - as you get further away from the shore and further away
 (13) from the bottom water velocities actually increase very very
 (14) rapidly The water is hardly moving at all when it's very
 (15) close to the bottom but then it actually increases in velocity
 (16) very very quickly very very rapidly
 (17) Q And these fish are swimming upstream by definition?
 (18) A Right they're swimming upstream and if they happen to get
 (19) up there with enough energy to spawn they've got to use every
 (20) trick that they can to conserve their energy for that so
 (21) that's exactly what they do
 (22) Q And on this video you've made some of these little white
 (23) things flow a little faster on the top and along the bottom to
 (24) demonstrate that difference?
 (25) A Right to show the difference in velocity as you move up in

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- (1) the water column
 (2) Q Shall we proceed?
 (3) A And this does it shows near bottom orientation of these
 (4) fish which are appropriately colored - or inappropriately
 (5) colored for counting sockeye
 (6) Q This right here shows the comparison of the speed of sonar
 (7) signal and that of a bullet This is actually about
 (8) one thirtieth of the actual velocity So if you want when we
 (9) fire this thing here in a minute we're going to fire the sonar
 (10) beam from the transducer?
 (11) A Right it's the actual time it would take for the sound
 (12) beam to go this 60 foot distance which is what this simulation
 (13) is would be on the order of a thousandth of a second or so
 (14) So we are actually slowing it down a considerable amount to
 (15) allow you to see it
 (16) Q We're going to compare it to a bullet from a gun and as
 (17) you say if you were doing this in real time it would be 30
 (18) times faster So fast you can't see it move?
 (19) A Right In fact - well we'll just go ahead and show it
 (20) And you can see the bullet didn't get very far and the
 (21) sound beam got a good distance
 (22) Q Sound beam went out hit the object and came back?
 (23) A Came back before the bullet there got out 15 feet. As we
 (24) go through here in velocities we'll actually show the screen
 (25) There you can see it So it's really rather surprising

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- (1) This is how fish are counted and we're going to look at
 (2) three situations counting one fish The sound beam itself
 (3) would be coming from the right to left
 (4) Can we stop right there? What you saw there are
 (5) several -
 (6) Q Dr Carlson if you want to come down here with the
 (7) Court's permission and point out things on the large one
 (8) you're welcome to do that
 (9) A There are several parts important about this What we're
 (10) doing is we're actually emulating the pulse the echo return
 (11) from a fish and how it looks on the oscilloscope
 (12) Q Stand over here so His Honor can see
 (13) A Okay This right here the reason for the shading is again
 (14) to try to demonstrate how the sound beam actually forms It
 (15) has much more concentrated energy in the center than it does
 (16) out towards the edges There's no sharp definition to the
 (17) sound beam It becomes weaker and weaker and weaker and
 (18) weaker until it essentially fades into the background
 (19) This right here shows the swim bladder in this fish here
 (20) This is actually appropriate scales for Kenai River sockeye
 (21) In the next one when we're actually looking at two fish
 (22) what you'll notice is as this beam comes out as this pulse
 (23) comes out as it starts to encounter the edge of the air
 (24) bladder why then the echo starts to form and it continues to
 (25) form as it goes through the fish and this is the result This

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- (1) is what goes back
 (2) Q That s the return echo?
 (3) A This is the return echo The return echo is very very
 (4) very much weaker than the energy that goes out
 (5) There s one more important thing about the return echo is
 (6) that it s longer than the pulse that was projected because the
 (7) scatterers in the fish have a discreet physical size
 (8) Q You want to stay down there?
 (9) A Oh okay That s counting one fish This is counting two
 (10) fish We have two fish that are fairly close together Stop
 (11) it there please
 (12) What allows you to count two fish to get two spikes here
 (13) on the oscilloscope is they have to be separated by a certain
 (14) distance and this distance turns out to be half of the width
 (15) of the outgoing pulse And there are good physical reasons for
 (16) that I won t go through it but that s the distance that you
 (17) have to have
 (18) It turns out for sockeye salmon on the Kenai and the
 (19) characteristics of the Bendix side scan sonar that fish have
 (20) to be almost touching before you can t resolve them as
 (21) individuals You can see these These echo returns are going
 (22) back There s space between them and that space between
 (23) them then shows up on the oscilloscope as independent peaks You
 (24) can recognize those as two and this is counting when fish are
 (25) too close

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- (1) Stop that there please In this particular case what we
 (2) have is the parts of the fish that are actually forming The
 (3) echoes are so close together that the echo that goes back
 (4) there s no space between it here It s overlapping So what
 (5) happens you don t get that single spike on the screen you get
 (6) another spike It s oftentimes but not always wider than the
 (7) spike that you would see from a single fish
 (8) When this happens why then you count two fish as one
 (9) fish You ve undercounted
 (10) Q So that s the situation that you want to avoid?
 (11) A That s a situation we d like to avoid
 (12) And this is the part I was telling you about counting fish
 (13) at Kenai passage rates This is a typical passage rate about
 (14) 900 fish per hour This is the beam as it typically occurs
 (15) These fish are zooming along a little faster than might be
 (16) optimum but you can see as they go through why then we
 (17) simulate just a single echo
 (18) When they actually go through this why then they re hit
 (19) several times but as you can see there s only a fish in the
 (20) beam every few seconds and that s the way it That s what
 (21) happens
 (22) Okay This is the second part We re looking at peak
 (23) passage rates now This is 5 000 fish per hour Fish are
 (24) coming through you can see it - we got some fish in there
 (25) lot of doubles and this is what - what the passage of fish

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- (1) looks like at peak passage rates on the Kenai River a matter
 (2) of maybe at the most a couple of spikes on the screen at any
 (3) one instant in time
 (4) MR COOPER Your Honor it s 2 00 straight up it
 (5) appears
 (6) THE COURT Before we adjourn for the day ladies and
 (7) gentlemen we got the note that you gave us through your
 (8) foreman Mr Murray yesterday about a possible jury view
 (9) That question had come up before it was raised by the parties
 (10) on two occasions I turned them down on that request because
 (11) there are some - there are some pretty tricky difficult
 (12) problems with a jury view under the circumstances it would
 (13) have
 (14) to be done in this case
 (15) In light of your request we re taking another look at it
 (16) We don t have an answer for you yet but we ll have an answer
 (17) I trust probably by Tuesday Please remember that we are not
 (18) going to be here tomorrow just like you would have forgotten
 (19) Also will not be here Monday We will be taking a four day
 (20) weekend
 (21) Please be especially careful this weekend when you re out
 (22) and around not to allow yourself to become involved in any
 (23) conversations or discussions with anyone about this case
 (24) Don t read or look at anything about the case
 (25) We will recess now until eight a m on Tuesday morning and
 I will see counsel lead counsel in chambers to take up this

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- (1) other matter again We ll be in recess now until 8 00
 (2) Tuesday Have a good weekend
 (3) (Recess at 2 00 p m)

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- (17) 8884 received 5808
- (18) 1968 received 5812
- (19) 8762 received 5814
- (20) 8778 A received 5819
- (21) 9360 received 5823
- (22) 8980 A received 5825
- (23) 8900 received 5898
- (24) DX1796 DX1799 DX1848 DX1849 DX1850 DX1867 Alpha
- (25) DX1871 DX1878 Alpha DX1880 Alpha DX1882 Baker DX1895

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 (19) DX8798 DX8803 Alpha DX8807 Alpha DX8809 DX9271
 (20) DX92272 and PX0379 and PX0398 received 5920
 (21) 5629 received 6000
 (22) 8989 received 6004

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- (1) STATE OF ALASKA)
 (2) Reporter s Certificate
 (3) DISTRICT OF ALASKA)
 (6) I Joy S Brauer RPR a Registered Professional
 (7) Reporter and Notary Public
 (8) DO HERBY CERTIFY
 (9) That the foregoing transcript contains a true and
 (10) accurate transcription of my shorthand notes of all requested
 (11) matters held in the foregoing captioned case
 (12) Further that the transcript was prepared by me
 (13) or under my direction
 (14) DATED this day
 (15) of 1994
 (21) JOY S BRAUER RPR
 Notary Public for Alaska
 (22) My Commission Expires 5 10 97

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Report

UNIQUE WORDS 3 367
TOTAL OCCURRENCES
16,101
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TOTAL WORDS IN FILE
48 771

SINGLE FILE CONCORDANCE

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